American Engineer

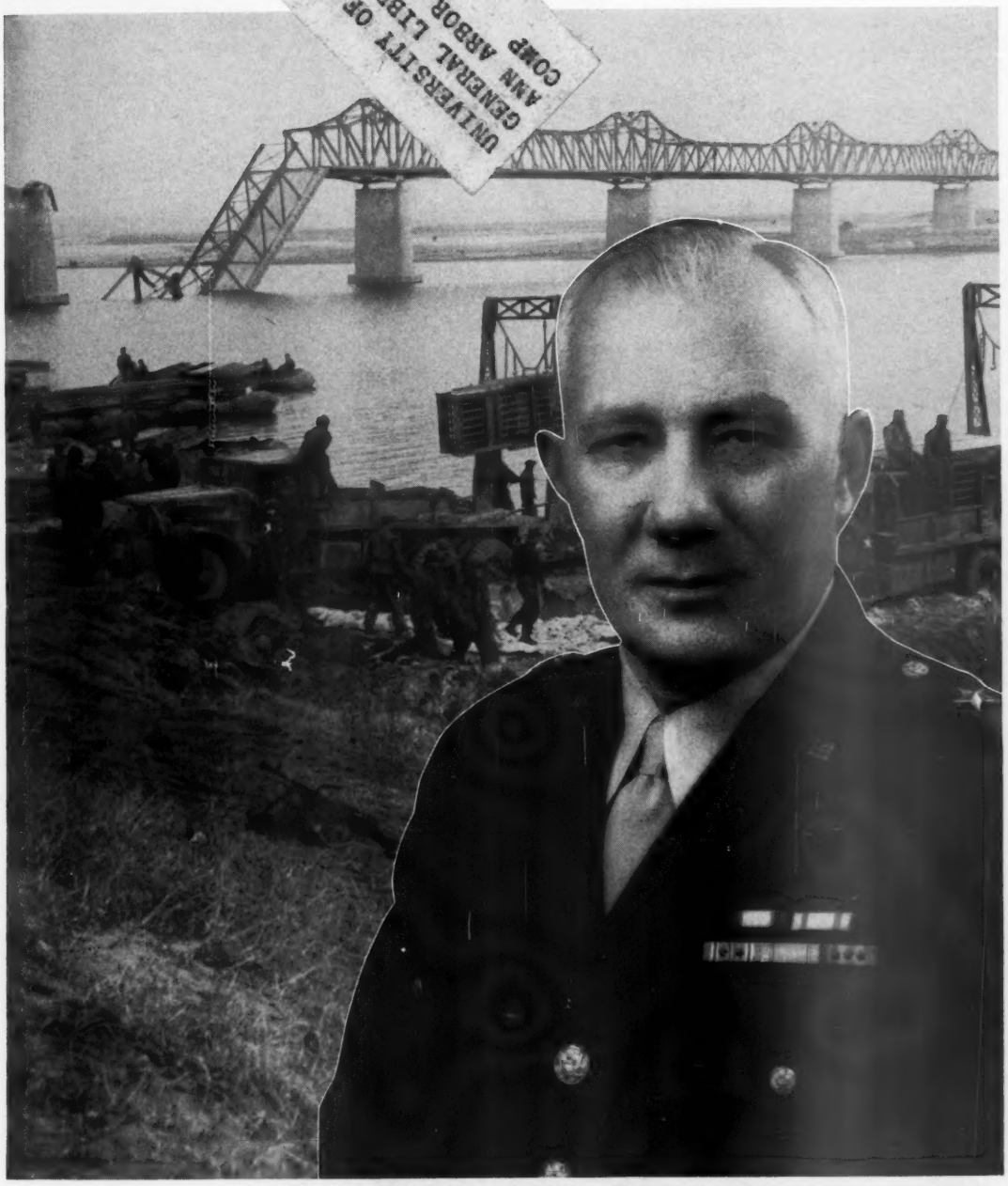
MARCH, 1951

UNIVERSITY OF MICHIGAN
MAR 13 1951
ENGINEERING LIBRARY

IN THIS ISSUE . . .

THE COMPLETE STORY OF OUR FIGHTING ENGINEERS IN KOREA

UNIVERSITY OF MICH.
GENERAL LIBRARY
ANN ARBOR, MICH.



MAJOR GENERAL LEWIS A. PICK, U.S.A.
The Chief Engineer Reports On The Corps' Work and Fighting

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
FOUNDED 1934

What's New

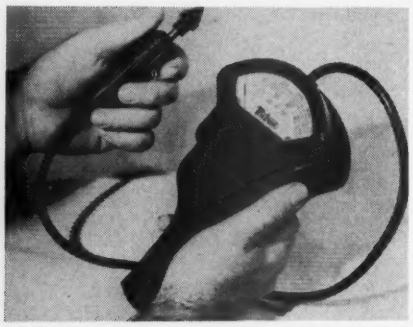
As a service to our readers, this column will describe briefly new product developments of general interest to professional engineers. When writing manufacturers, we will appreciate your mentioning the American Engineer.

● The Dravo Corporation of Pittsburgh, Pennsylvania, has developed a big welded steel shipping container to enable construction companies to store large amounts of dynamite near blasting sites and to protect it against pilferage.

The 275 cubic foot boxes have a weight capacity of six tons and are ideal for dynamite storage and tool cribs because they can be transported by barge, ship, railroad, car or truck. Equipped with skids, they can be dragged by tractors. Lifting rings are provided on the top for moving them with a crane, and the doors are fitted with locks.

To minimize the hazard of sparks from contact of shoe nails or tools with the metal floor and walls, the dynamite containers are lined with one-inch sheathing. This also acts as a barrier to lessen the impact of stray bullets in hunting areas. The boxes are weathertight and can be stored in the open. For additional information, write the Dravo Corporation, Neville Island, Pittsburgh 25, Pennsylvania.

● The Metron Instrument Company of Dever, Colorado, announces the new Metron Type 25D Hand Tachometer with new speed measuring ranges: 100-1000, 200-2000 and 500-5000 RPM and FPM; and 10-100, 20-200, 50-500 FPM. These new ranges are ideally suited (without range extending adapters) for speeds encountered in motor and generator testing, process control, and maintenance work. Range extending adapters are available to measure speeds as low as 20 RPM and as high as 50,000 RPM for special applications.



Other outstanding features include: Quick response — can be used for acceleration tests; self calibrating check circuit; undamaged by overspeeding or selection of wrong range; sustained high accuracy with long life; and low operating torque. The Metron 25D Hand Tachometer is supplied in an attractive carrying case complete with accessory tips, extension, feet per minute discs and instruction. For additional details write the Metron Instrument Company, 432 Lincoln Street, Denver 9, Colorado.

● The Curtis Universal Joint Co., Inc., Springfield, Mass., has recently announced the development and availability of a new "Ball Type" Universal Joint. The Curtis "Ball Type" Joint is designed for light duty applications, and is available in four sizes: ½"; ¾"; 1"; and 1¼"... single or double, solid or bored hubs.

The new joint has steel forks bearing upon a bronze ball with heat-treated centerless ground pivot bearing pins. The large pin is equipped with Curtis patented oiler. For further details write the Curtis Universal Joint Co., Inc., Springfield 7, Massachusetts.

● The W. W. Sly Manufacturing Company of Cleveland, Ohio, has just brought out a new handy sandblast cabinet for cleaning tools, pistons, piston rings, valves and other small parts. It is complete, including two light fixtures for illuminating the interior, an exhaust fan and a dust bag for making the operation dustless.

It has two rubber sleeves for both arms of the operator, with rubber gloves attached. It measures 14"x 17" and can be placed on a work bench, connecting it to a compressed air line and to a 110-volt lighting circuit for the lights and the exhaust fan. For further details write the W. W. Sly Manufacturing Company, 4700 Train Avenue, Cleveland, Ohio.

● The National Carbon Division, Union Carbide and Carbon Corporation, now has available an improved hand serrating tool for use with "Karbate" Brand Impervious Graphite pipe.

Complete details of the Hand Serrating Tool and the accepted method of serrating "Karbate" Brand Impervious Graphite pipe may be obtained by writing National Carbon division, Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, New York.

American Engineer

MARCH, 1951

► **COVER STORY. Our Fighting Engineers in Korea** 7
By Maj. Gen. Lewis A. Pick, Chief of Engineers, U. S. Army. The complete story by a man who should know.

Birds of a Feather 10
By George W. Clark, P.E., Immediate Past President, Ohio Society. What about architect-engineer relations?

We Must Adjust To Today's World 12
By Sidney L. Stolte, P.E., President, NSPE. A lot has happened in the last half century and engineers have been a part of most of it.

The Engineer-Power Problem 14
By Frank W. Edwards, P.E., Director, Dept. of Civil Engineering, Illinois Institute of Technology. Picking an old problem to pieces and suggesting some new solutions. A "Think" Article.

Another 1,000 Contribute To Public Relations Fund 18

Regular Features

Editorials 4
► We'd Like To Have You Meet (A New Feature) 5
Accent On Activity 17
What They're Saying 20
Book Looks 22
Letters 23
Around The Nation With Our Members 24

Editor
KENNETH E. TROMBLEY

Business Manager
ARTHUR F. BECK

Publications Committee, NSPE
GEORGE J. NICASTRO
Chairman

"This is the true joy in life, the being used for a purpose recognized by yourself as a mighty one; the being thoroughly worn out before you are thrown on the scrap heap; the being a force of Nature instead of a feverish selfish little clod of ailments and grievances complaining that the world will not devote itself to making you happy."

—G. B. SHAW

CCA
Member, Controlled Circulation Audit

Advertising Representative:
Warren T. Mayers Company,
130 E. 61st Street,
New York, N. Y.

The American Engineer is published monthly by the National Society of Professional Engineers, 1121 15th St., N. W., Washington 5, D. C. Entered as Second Class Matter Feb. 8, 1948, at the Post Office, Washington, D. C., under act of March 3, 1879. Copyright, 1950, by the National Society of Professional Engineers. Not responsible for opinions expressed in signed articles. Subscription Rates: $2 per year in advance to members of NSPE and its Affiliated Societies; $3 per year in advance to non-members in U. S. A. and its possessions, Canada, and Mexico. Foreign, $4 per year. Single copy, 35c.

EDITORIALS

Doing Right . . .

An article from General Electric's house organ, the *Commentator*, has come to our attention, and because the writer, a company official, has so expertly dealt with a mundane subject, we would like to comment upon it here.

The subject or theme of the piece is learning to live in our new America of defense without war. Quoting Economic Stabilizer Eric Johnston, the author says: "Wage and price controls will not be effective for long. It is essential that we begin to cure the reasons that have made wage and price controls necessary. It is also essential to preserve freedom in this country, which means that we must get rid of wage and price controls at the earliest practical moment. Any controls must be temporary, because these controls lead to other controls."

Amen, Mr. Johnston, but how? Well, the *Commentator* has an approach. To sum it up in three words: Doing right—voluntarily. We have got to support getting expenses down and to balance the budget. We have got to help credit control do its anti-inflationary work—and then make such control largely unnecessary—by self-restraint in our practices in buying, selling and saving. We have got to give our full skill, care and effort to the greater production we must have—knowing all the time that defense will be expensive and will require personal and economic sacrifices. In short, we can still have our freedom—if we want it.

To be free—to have a minimum of controls now and to get rid of them as soon as possible—we as individual men and women have got to learn to judge what is the sound and *right* thing to do . . . at work, at play, at the voting booth, at the grocery, at the union or stockholders' meeting, and elsewhere when considering matters affecting our material and spiritual well-being.

But *knowing* what is the right thing to do, the *Commentator* continues, is not enough. It will not set us free or keep us free. We could still be ordered to do what others think is the right thing to do. To be really free, we as individuals must not only know and do the sound and right thing, but we must do it *voluntarily*—by reason of that inner driving moral force we call character, and not because a policeman is standing over us.

We think the GE official has placed his finger upon the one thing that can keep us living a relatively normal life in the years ahead—strength of character. As important professional men, engineers everywhere must continue to be a stabilizing influence in all walks of life by doing right—voluntarily.

The Unity Problem . . .

As has been frequently reported in this magazine, representatives of fifteen engineering societies known as the Exploratory Group To Consider the Increased Unity of the Engineering Profession, have long been discussing how unity in the profession could be brought about. In last month's issue of the AMERICAN ENGINEER, the various plans to accomplish this objective were presented. Since that time, N.S.P.E. President Sidney L. Stolte, in submitting the unity report outlining the plans to States and Chapters, made several comments that are worthwhile repeating here.

The four tenets, President Stolte said, on which N.S.P.E. believes an enduring and lasting unity organization must be founded are:

1. The unity organization should be composed of engineers only.

2. It should be composed of individual engineers having a voice in its affairs and to whom its officers and administration would be responsible in the best democratic sense.

3. Since every engineer is a citizen, the organization should be effective at the three levels of interest of the citizen-engineer, that is, the community, the state, the nation.

4. That every engineer, once he has met the basic qualifications, should be on par with every other engineer.

President Stolte then pointed out that any plan acceptable to the N.S.P.E. philosophy must be analogous with these tenets. Turning to the individual plans (*Editor's Note*: *See pages* 18-19, *February Issue*), the Society's president noted that Plan "C" represents a compromise which would require two actions on the part of N.S.P.E. They are:

1. The N.S.P.E. would have to be willing to merge its Board of Directors with the Engineers Joint Council or some modification thereof.

2. If N.S.P.E., its state societies and local chapters were to become the nucleus of the new unity organization, these elements would have to provide for the affiliation of those members of the participating societies having high qualifications, whether or not they were registered.

These are the considerations before the Exploratory Committee of which N.S.P.E. is a part. President Stolte urges that every member of the N.S.P.E. give serious consideration to this important problem and discuss it carefully not only with fellow Society members, but other professional engineers as well. The opinion of each engineer should be expressed to his chapter officers and through them to State Society officials. In addition, each member should voice his opinion to officials of other engineering societies of which he is a member. In this way, all will approach the solution to this problem reflecting the attitude of the members of the respective societies and of the profession.

Engineers' Week . . .

Engineers' Week, 1951, is history. For the first time in the annals of the NSPE or, so far as we can ascertain, the entire engineering profession, a strong group of America's engineers has made a concerted attempt to call the public's attention to the profession and its accomplishments.

Our 1951 Week celebration would not be placed under the heading of a "first class job" by an expert public relations man. But anyone familiar with the profession's history will be encouraged by the success that was realized. Couple a first attempt with the small amount of money from NSPE funds that was available for the effort, and one feels much hope for the future. Its success has depended on the untiring efforts of many engineers. It shows what the profession can accomplish when its collective efforts have been mustered.

We'd Like To Have You Meet...

Ole Singstad, P.E.,

... Member, New York SSPE ... Chairman, NSPE's Salary and Fee Study Committee ... Outstanding tunnel designer ... Winner of honors from many countries and universities ... Author of Technical Papers and a man who likes to fish.

Ole Singstad, P.E.

If you like extraordinary ability and a firm will coupled with a charming modesty, then you should meet Mr. Ole Singstad, P.E., well-known tunnel designer and member of the New York State Society. Best known for his work on the Holland Tunnel, Singstad is respected and admired by fellow engineers and laymen alike, having been knighted by Norway and Belgium in addition to being an honorary member of the Harvard Engineering, John Ericsson and International Mark Twain Societies. Moreover, he has been awarded honorary doctoral degrees from New York University, Stevens Institute of Technology, Newark College of Engineering, and St. Olaf College of Minnesota.

Born in Lensvik, Norway, he spent most of his free time in winter sports such as skating and skiing. He was also quite interested in trout fishing and still gets more enjoyment out of "whipping a stream with a dry fly for the elusive trout than from anything else." Wanting to be a Civil Engineer from childhood, he entered the Polytechnica Institute of Trondheim, Norway and received his degree in Civil Engineering in 1905. The same year he came to America.

In making a general comparison of Norwegian and American engineering, he feels that although there have been many changes and improvements since his college days, there is at present little difference between the best engineering curricula in the two countries. There is, however, a difference between the entrance requirements.

In explaining his motivation for coming to America, Singstad says, "It must have been a combination of the urge, inherited from my Viking ancestry, to see what the world looked like on the other side of the 'mountain' and also the attraction of greater opportunities in America." His first impression of the United States was the "greatness of the country and the boundless opportunities for work for a young man." Soon becoming absorbed in his profession, he decided to make America his home, and became a citizen in 1911.

He considers the designing of the Holland Tunnel and the development of its ventilation system to be the most challenging engineering project which he has ever undertaken, as it was a "pioneer task never before undertaken for a tunnel for automotive traffic." On November 11, 1927, at the time the Tunnel was opened, the *New York Times* stated: "To Ole Singstad, Holland's design engineer, fell the task of finishing an undertaking that will rank with such engineering monuments as the Panama Canal ... Technical history was written when the ventilating apparatus was designed."

In advising the young engineer, Singstad says he should have a genuine liking for his profession, be willing to work hard and "his attitude should be one of contributing his part towards making engineering a great profession rather than a mere means of earning a livelihood. In meeting difficult situations, he should be governed by principles rather than by expediency."

We are proud to salute Norway's welcome gift to America, Mr. Ole Singstad, P.E.

The Holland Tunnel Where New York State Meets New Jersey.

OU

LAST J
rive
aga
Army
tern of
mine fi
ways a
with a
provisi

Of n
fight p
port ot
quently
the 38
flanked
by com
but the
over al
forcing
helped
too fev
routes.
tions d

In th
1. For
the ha
his sm

Ther
been re
Nation
had be
the nu
enemy

Key
the int
were fi
launch
plished
up; ar
were c
the Ind
by the

The
the loa
tanks,

ABOU
to gat
the en
landin

Left. M
the da
near V

Marc

OUR FIGHTING ENGINEERS IN KOREA

By Maj. Gen. Lewis A. Pick,
Chief of Engineers, U. S. Army

How Did The Corps of Engineers Aid In The Breakout From Pusan? What New Techniques Did We Have To Learn In Order To Win In Korea? Read This Factual Report Of The Entire Conflict By The Corps' Number One Man

LAST July, just eight days after the staff of I Corps arrived in Korea to spearhead the United Nations' drive against communistic-inspired aggression, the attached Army Engineer units began cutting their now famous pattern of rapid-fire bridge construction, demolition, combat, mine field and obstacle clearing, and restoration of railways and roads. The work was of necessity accomplished with a minimum of equipment and a maximum of improvision.

Of necessity, American units were first thrown into the fight piecemeal. There was practically no Engineer support other than that furnished at division level. Consequently, during the first prolonged withdrawal south of the 38th Parallel, the overwhelming enemy forces outflanked the United Nations' positions. Demolition work by combat engineer units was of paramount importance; but the unusually dry summer made bridge destruction over all except the major streams of little good beyond forcing the enemy to use reinforced fords. Mine fields helped; but unfortunately there were too few mines and too few Engineers available to properly seed all flanking routes. The enemy, step by step, forced the United Nations defenders down into the Pusan perimeter.

In this tight perimeter the battle was joined on August 1. For approximately 45 days the struggle raged, with the hard-pressed U. S. Army commander skillfully using his small reserves to parry one thrust after another.

Then, suddenly, in mid-September, the forces that had been retreating for eleven weeks struck back. The United Nations forces took the offensive. The same Army that had been called "weak" suddenly overwhelmed and routed the numerically stronger and once successfully driving enemy.

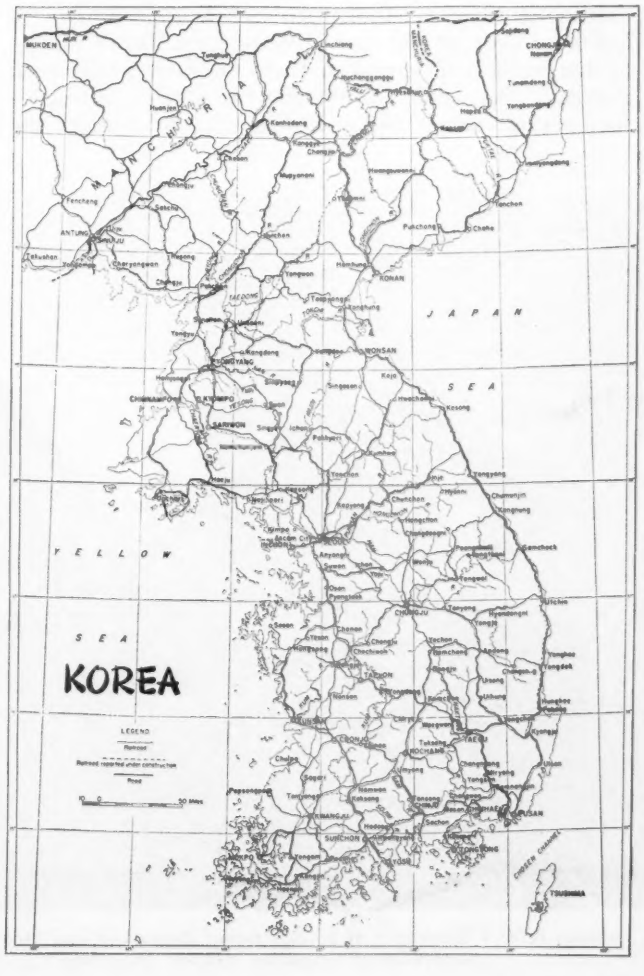
Key to this abrupt turn-about was the fact that during the interim between July, when United Nations forces were first committed to battle, and September, when they launched the counter-attack, two things had been accomplished: 1) The number of combat troops had been built up; and 2) facilities necessary to supporting the attack were completed. This readiness—keyed to coincide with the Inchon landing—was made possible in large measure by the U. S. Army Engineers.

The first essential of a supply line is a road net to carry the loads imposed by modern warfare—the troops, heavy tanks, bulldozers, and thousands of trucks.

ABOUT the middle of September, the Engineers were told to gather their strength for a total offensive to destroy the enemy. On September 16, one day after the Inchon landing, the United Nations took the offensive. With this drive, the Engineers (who had fought and worked through weary days and nervous nights of delaying tactics, and had built the facilities to support the attack) began an extensive mine field and obstacle clearing operation. For each mile of ground gained, they had to clear mines that previously had been laid by both themselves and the enemy. Each bridge and river crossing that the Engineers had destroyed during the withdrawal had to be rebuilt. Roads and railways had to be re-constructed.

The one slender construction battalion, plus the precious few supporting units then available, had to assume the job of major bridge construction. Particularly did the wide and deep Naktong River have to be mastered for the assault troops.

Bridging the Naktong River typifies largely the pattern of U. S. Army engineering throughout the Korean campaign. The improvising, the making of scarce materials do a multiplicity of jobs, the courage and extreme diffi-



Left. Men of the 34th Engineer Battalion prepare to remove the damaged section of a bridge across the Naktong River, near Waegwan. It was replaced with a Bailey Bridge.

culty of work under front-line, combat conditions—and the successful accomplishment of each mission—has written a new saga in Corps of Engineers' history.

At the Naktong, the high railway and highway bridges had been demolished. At it, the first U. N. offensive of the war was stalled. Hastily, the Army Engineers, working with improvised equipment, without proper cranes and tractors, threw a temporary 800-foot treadway to carry the first troops and medium tanks across.

But treadways were in precious number, and this one had to be used at another site. So work was begun simultaneously on the railway and highway bridge. To close the 200-foot gap in the highway bridge, a 100-foot triple-single Bailey and pile bents were used. The job was hampered by piles that were too short, and by the great mass of former bridge structure now at the river's bottom.

The railway had a 165-foot gap, with rails 50 feet above the water and the remains of the old bridge 20 feet below the surface. Only piling of 30 and 40 feet was available to do the job. Two-story timber bents were supported by spliced piles that reached up to the 24-foot I-beams supporting the rails. Steel was blasted away below the water and cut above. At one time, four pile drivers were operating simultaneously—two on rafts at mid-stream and one at each end of the bridge. An assembly line manufactured trestles. Seven days of exhausting, bone-crushing work and the job was finished. The advancing troops moved forward — and the Engineers moved northward toward Seoul.

WHILE the treadway bridge was being constructed across the Naktong, a M4A2 ferry, capable of handling 46-ton trucks was erected at a site several miles north. But an enemy high velocity gun riddled the ferry's pneumatic floats, curtailing operations dangerously. Consequently, it was decided to place an M4 trestle bridge 90 feet long over an existing sandbag ford. Work on the bridge began at daybreak and was finished at 6:50 p.m. that day. The sandbag ford was torn out beneath two 30-foot interior stands of the bridge (but not beneath the 15-foot abutment spans), to increase the flow beneath the bridge, and decrease the depth of water over the ford. It made what has become known as an "underwater" bridge —of the type used with varying degrees of effectiveness by the communist troops. The sandbag ford (or underwater bridge) carried all vehicles except jeeps. Tanks, however, tore up the sandbags so badly they were ferried across.

The bridging which has proved so essential in Korea represents only a portion of the U. S. Army Engineer activities.

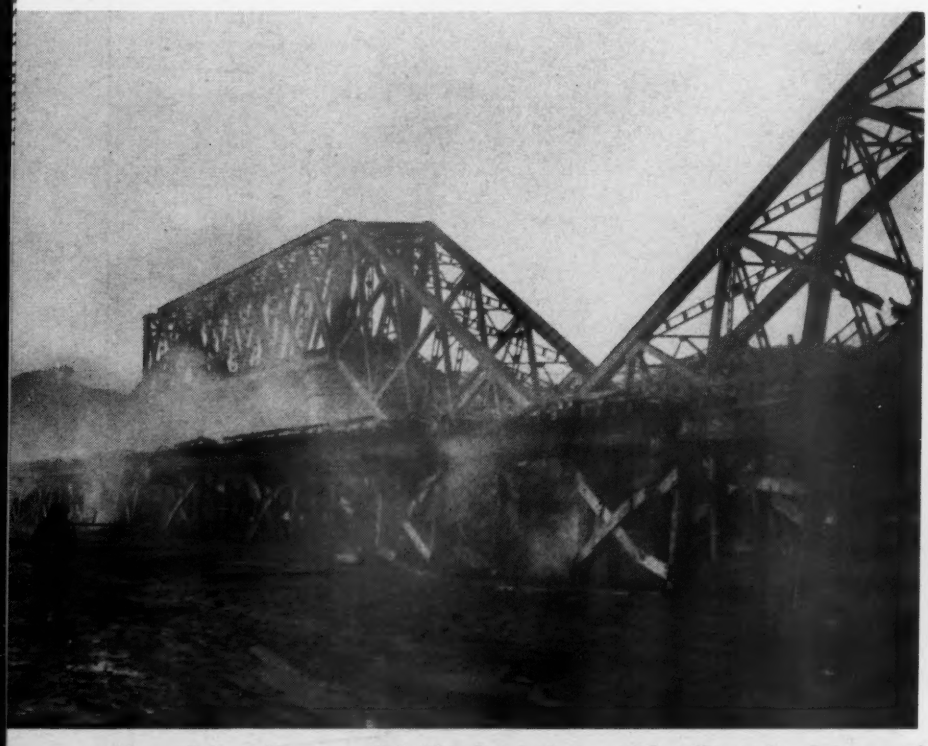
At Pusan, engineers worked 24-hour shifts on construction and supply projects. The all important air bases were built, maintained, destroyed and rebuilt by the aviation engineers. The dump truck companies have their own stories of unceasing labor to rebuild the roads and keep them passable. Water supply, depot companies, equipment and maintenance are vital. Pipe lines are constructed to keep gasoline moving from port to airfield. But it has been the bridge construction units that have borne the heartbreaking jobs.

In northern Korea during the Marine Corps' breakthrough, an Army Engineer unit made history. The enemy had blown gaps in a reservoir dam, cutting the path of the Marines' retreat. The encircled Army Engineers had steel sections of treadways flown in. The first air-drop of a bridge was accomplished. And for the first time it was determined that sections of steel treadway are excellent for bridging a fixed span.

THE Marines and the supporting Engineer units broke out of the trap over the improvised bridging across the blown dam.

Battle conditions have proved the serviceability of several types of Engineer equipment developed after World War II. Particularly serviceable has been the series of bridging called M4, M4A2, and the combination, M4-M4A2.

The M4 bridge was developed during World War II but not in time to be put in production. Designed to be of



Above, left. A Korean rail bridge being destroyed last December by men of the 65th Engineer Battalion. On the right: A professional engineer officer (kneeling) inspects strengthening work on bridge at Yongwol.

much lighter weight than the old type for transporting and handling purposes, the M4 utilizes aluminum alloy pontoons and aluminum alloy balk that serve as both stringers and flooring. The M4A2 is a modification designed to be supported on the same type of 18 ton pneumatic floats employed in the familiar treadway bridge. It has been this type (the M4A2) that has been used most frequently in Korea.

In constructing the M4A2 bridge, saddles, saddle adapters and removable gunwales are placed on the floats. On these are laid the longitudinal aluminum alloy balk, which serve as both stringers and flooring and are placed in contact with each other. The balk are practically square in cross-section and are sealed so that they will float. Balk are held tight by lugs which fit into the gunwales and are pinned in place. Trestle sections also are provided for use in water too shallow to float pontoons or over dry gaps. As most of the parts can be man-handled, the bridge has a great advantage under field conditions.

Korea has been noted particularly for its bad roads. Dusty in dry weather, muddy in wet, narrow, and twisted with pretzel turns in the hills. Before the first offensive was launched to carry the United Nations' forces to the Manchurian border, the roads had to be straightened and widened—and this done while war traffic pounded them day and night.

For example, when U. S. military traffic first began to use the main artery from Taegu to Pusan, the speed was limited to no more than 15 miles an hour by the road's condition. Often, road-jams would hold the long convoys stationary for hours at a time. The road was solid, however, with underlying stone and gravel. The Army Engineers were told to widen it. By September, when the offensive began, this main highway was a dual-lane, with a 30-mile speed limit placed on it by military law. It payed off particularly when U. N. forces were called upon to shuttle between the northern and southern sectors of the Naktong River front, in General Walker's successful effort to make up in mobility what he lacked in numbers.

Today, the U. S. Army Engineers have the needed men and equipment. The once desperately short truck-mounted cranes, bridging, light D4 tractors, and maintenance companies are in good supply. The once green combat units are seasoned veterans. And once again they are spearheading the drive toward ultimate victory.

A Word About Major General Pick . . .

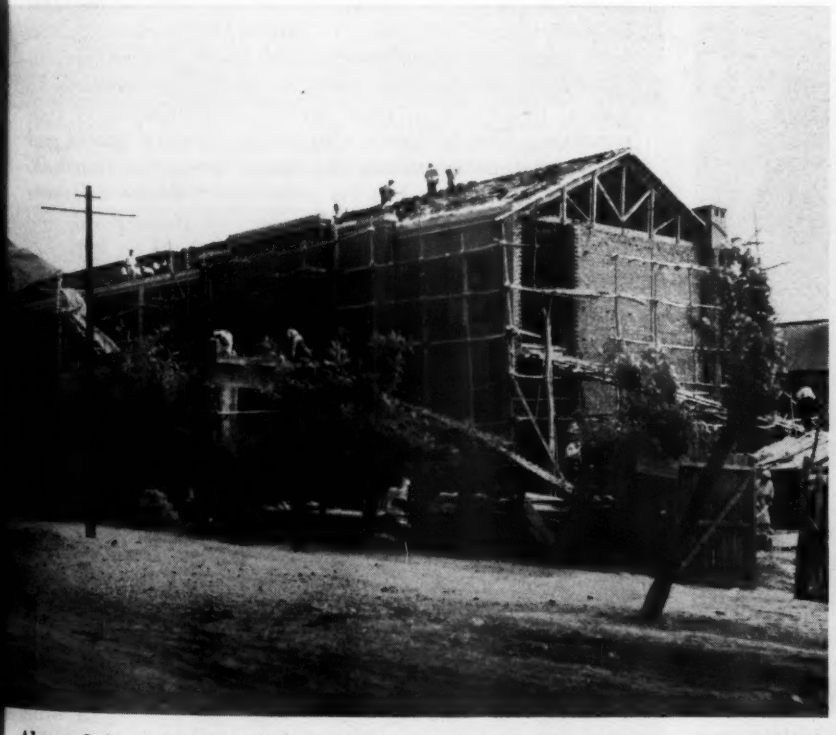
A Virginian, Lewis A. Pick was born in Brookneal in 1890. Always interested in things technical, he decided to attend Virginia Polytechnic Institute and was graduated from the school in 1914. America soon went to war and when the young engineer was offered a commission as a first lieutenant in the Engineer Reserve he quickly accepted. Prophetically enough, his first assignment was in the office of the Chief of Engineers at Washington, D. C., where he was to return thirty-two years later as the Chief of Engineers.

By 1925, he was military assistant to the engineer of the New Orleans Engineer District and he later became engineer of that district.

After attending Command and General Staff School at Fort Leavenworth he became a major. He then attended the Army War College, later becoming executive assistant to the engineer of the Ohio River Division at Cincinnati, Ohio, and in 1942, he was named engineer of the Missouri River Division at Omaha, Nebraska.

In October, 1943, he began a two year tour of duty in Burma as commander of an advanced section of the Army Service Forces. Upon his return to this country, General Pick became engineer of the Missouri River Division at Omaha. On January 31st, 1949, President Truman appointed him Chief of Engineers.

—U. S. Army photographs



Above, left: A building being constructed by the 76th Engineer Construction Battalion in Pusan. Right: Engineer officers place satchel charges on a railroad bridge near Pyongyang preparatory to demolishing it.

Birds Of A Feather

By George W. Clark, P. E.
Immediate Past President, Ohio Society

Should Architects and Engineers Work Together? What Is To Be Gained For the Two Professions and the Public By Cooperation? Read What This Prominent Engineer Has To Say.

Working together. The engineer and the architect can eliminate any friction between them through understanding and mutual respect.

I HAVE chosen the above title for this article because it symbolizes, in my estimation, the self-evident relation between architects and engineers. "Birds of a feather flock together." I have not taken the time to look for the source of this familiar quotation but I often ponder over the circumstances which conceived it and the conditions which nurtured it until it became universally accepted. Its basic truth may be challenged and perhaps disproved. Its implications need qualification, and its realization needs a meeting of the minds. Let us examine our theme along these lines.

Some time ago I was travelling along a narrow blacktop road winding up, down and around the hills of Knox County in Ohio. As I crossed a ridge my eyes feasted on a beautiful valley through which the road meandered, and far ahead my eyes rested on a large cluster of white spots which as I approached turned out to be a flock of turkeys. The sight of all these white turkeys gathered around their roost reacted first on my gastronomic machinery. The next thought, as I passed by several other large groups, was that beyond doubt, birds of a feather flock together. I had scarcely said that when I saw another flock of bronze birds and I realized how accurately the quotation fitted, for in the white flocks were no bronze birds, and no white birds were to be found in the bronze flocks.

Are Architects and Engineers birds of a feather? Let us consider this from several angles. In the first place let us consider our common heritage, our common interests. Through the centuries Engineers and Architects have been called upon to be the builders of Empires. We have been dreamers who by an alchemy of science, industry and imagination have crystalized our dreams into realities. Today beautiful cathedral spires reach into the heavens where our sleek transport planes ply their commerce. Long before these examples of our artisanship were a reality, however, their authors had a vision, an ephemeral thing in the mind's eye. This vision was put on paper, its component parts designed, balanced in form, strength, and functions into an integrated whole according to well thought out principles of sound theory and design. The educational background of Architect and Engineer stem from a common origin, follow along parallel lines. We all have to know the strength of materials, the proper utilization of its special properties to meet specific requirements of construction. The Architect who has to combine spaces and masses and measurements and shapes into a functional design for a building has his counterpart in the Engineer who combines power and angular velocity and size and strength into a beautiful diesel locomotive. And who is to say that aesthetic beauty and functional beauty may not arise from the same genius?

WE might consider the legal approach to the oneness. An examination of the Registration Acts for each profession reveals that both acts are predicated on the premise that the regulation of the practice of Engineering and Architecture is a function of our state government in order to "safeguard life, health, and property." Nowhere is it implied that registration is provided to protect an individual Architect or Engineer from competition, fair or unfair, by another member of his or another profession. It is well to keep in mind this very important basic concept of professionalism, that it exists not for its own selfish promotion but for the common good of the people. That profession is doomed which concerns itself only with improving its own selfish interests for it then will lose the interest and support of the sovereign state.

If we look further and examine Court action in support of registration, we look in vain for convictions based on the protection of an Engineer or Architect, or of the profession as a whole. Convictions are based on protecting public welfare against malpractice by registrants or by violators seeking to circumvent the express provisions of the Acts, and not on the obvious fact that services rendered by unqualified individuals cuts in on the practice of registered men.

FURTHER analysis of the separate registration acts of Engineers and Architects indicates how closely allied the two professions really are. The structure and wording of the Acts, the provisions for the establishment and operation of the Registration board; their duties and responsibilities under the act, all these show a commonness of purpose that seems to point out tacity the closeness of the two professions.

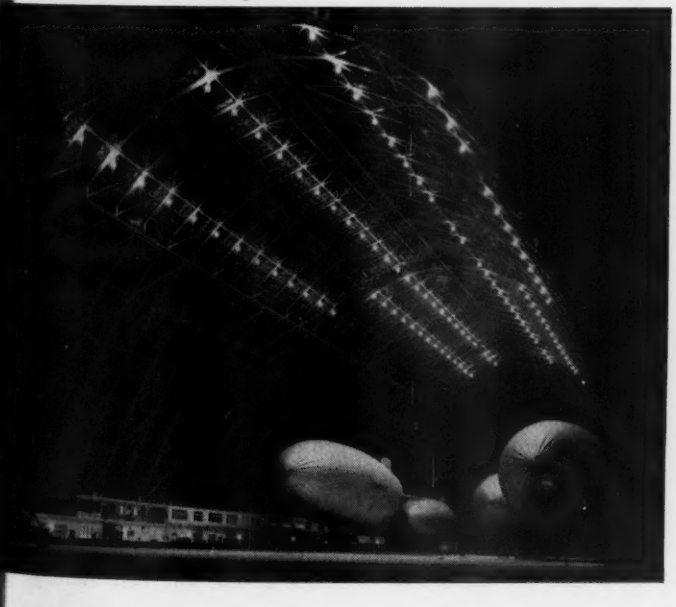
Nationally unity is even more emphatically revealed by the existence of a common Board of Registration for Architects and Engineers; Arizona, Minnesota, Missouri, Nebraska, South Dakota, Tennessee, Virginia and Wisconsin as well as the territories of Alaska, Hawaii and Puerto Rico have such boards. Dramatically they indicate that the engineer and architect are indeed birds of a feather.

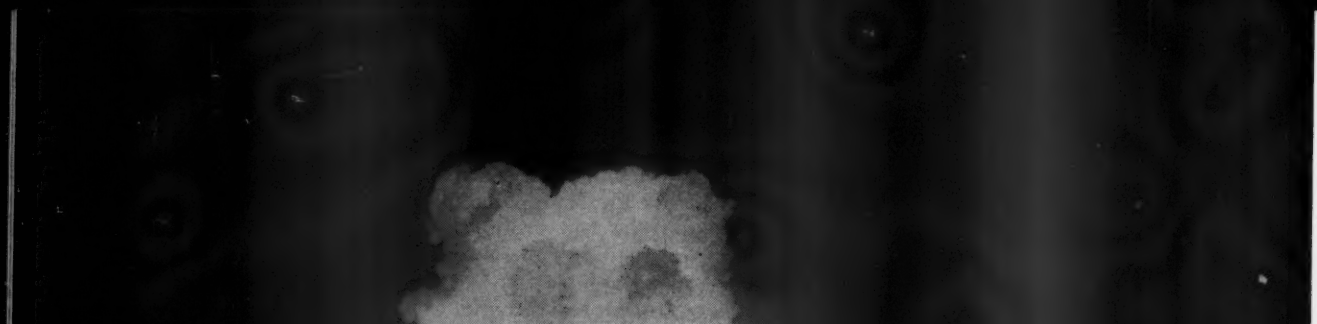
From the standpoint of professional thinking and behavior the two professions have much in common. We have organized ourselves nationally and statewise along parallel lines. Our national society is made up of what one might call a federation of State Societies. Each local chapter is privileged to draw up its own Constitution, establish its own dues and committees as they may best serve to meet its needs, being amendable, however, to the Constitution of the state societies, which in turn can operate autonomously subject to the Constitution of the National Society.

The Architects society seems to be established along parallel lines. We both seem to find need for certain committees of like responsibility, such as Legislative, Membership, Public Relations, Education and Professional Practices. If we were to examine the agenda and minutes of

(*Continued on page* 31)

Products of cooperation. The beautiful modern building above, the huge hangar below, or the San Francisco-Oakland Bay bridge—all belong to the architect and engineer and their combined genius.





The burst of an atom bomb at Eniwetok. The engineer's mind has conceived much since 1900.

We Must Adjust To Today's World

By Sidney L. Stolte, P. E.
President, National Society of Professional Engineers

We have just turned the half-century mark and we have every reason to believe that the next fifty years will see just as great a change in our way of life as was experienced during the last fifty. Even in my memory (and I cannot testify to conditions as early as 1900) I can remember when the horse and buggy and the team of bays hitched to a lumber wagon were our means of transportation. Grandad only lived seven miles north of town on a farm—but it was an all day trip for him to take the farm produce to town, do the shopping and return in time to do the chores at night.

I remember the first steamer car I saw and how it was considered reckless driving to speed down the street at more than fifteen miles an hour.

In a few short years, also, came the telephone, the movies, the radio, the airplane, TV, the A-bomb, jet propulsion, radar, the H-bomb and supersonic speeds to name just a few.

Of a more personal consequence in terms of heat, light, food and shelter have come vast improvements to afford these basic necessities for living or better living and, with the increasing size and density of population centers, have come protected and even treated water supplies, sewage disposal, refrigeration including deep freeze units, air conditioning even to electronic filters and disinfecting rays. Plastics have revolutionized not only material for utensils but for wearing apparel, fabrics of all kinds and substitute products for almost all articles we had considered as being possible only from so-called natural or raw materials.

When nature indicated a limited supply of a needed raw material, research activities were launched and a synthetic substitute was developed.

We are the greatest builders of roads, railroads, bridges, dams, power plants, buildings and machines of every description that the World has ever known.

I remember in the Thirties we had an exhibit at a local art gallery depicting the relative size of the earth in various periods up to the present and how in a short space of time the size of the earth had shrunk from a huge sphere of several feet in diameter to a small ball of only an inch or two in diameter, all due to increasing speeds of travel. In the short space of a hundred years, the distance from Minnesota to California has changed from a trip requiring months to one of hours. I can now pick up the telephone in St. Paul and call New York, Los Angeles or Dallas, Texas, as easily as I used to call my next door neighbor.

Why do I mention all these developments? Only because at the bottom or in the middle of each you will find the engineer or many engineers. It is true that often the engineer is not the only member of the team, for it may include research scientists, chemists, physicists, mathematicians and the like; but, finally, it is the engineer that applies the knowledge to make the item practical for production, construction or use for the convenience of man.

I always like to get back to certain fundamental definitions in order that we may all have the same appreciation or understanding of the facts involved. We are talking about the professional engineer. Just exactly what is the professional engineer?

We all know how widely used is the term "engineer." Quite recently, and to our profession's embarrassment, a commemorative stamp was issued by the government dedicated to the "American Engineer"—and who was he—Casey Jones!—the operator of the railroad engine or locomotive. We know that most occupations, if they can somehow add the handle of engineer to the job, can thereby

give it prestige, importance and even dignity—but, by the same process, they have diluted the meaning that you and I have of an engineer.

Especially during the past fifteen years have we been wrestling with this very item. The more we studied the scene, the more it seemed that we were butting our head into a stone wall if we wanted to undo all the damage we had allowed to grow in society through the ages by the promiscuous use of the term engineer. Some of our forerunners in the profession must have had this vision because, in 1907 in Wyoming, they passed the first registration law in the United States for the practice of the profession of engineering. Not until some twelve years later did this thought really take root when state registration laws for engineers jumped from four to twenty by 1921. Gradual expansion continued until a more pronounced spurt in 1935 carried the total states covered to 35. The idea was then over the hump, but not until 1950 did we complete the coverage when the District of Columbia registration act was passed by Congress. Now all states and territories of our country require that a professional engineer must be registered before he is allowed to practice and, in most cases now, the state registration laws are quite explicit that in order to safeguard life, health and property and to promote the public welfare, any person offering to practice professional engineering shall be registered. The laws even go further and state that it is unlawful for any person to use in connection with his name any title or description tending to convey the impression that he is a professional engineer unless such person is qualified by registration.

Why all this concern?—only because, when unqualified persons attempt to practice our profession, life, health and property are in jeopardy.

Now we get down to the point of definition that started all this part of the discussion. Laws to be constitutional must be clear to the man of ordinary intelligence so he can determine whether he is inside of or violating a law. Our registration laws must therefore define a professional engineer and the practice of professional engineering.

To make short a long series of personal experiences in arriving at such a definition and particularly after the Illinois law was declared unconstitutional, I believe in 1944, I have the following personal definition of a professional engineer:

A professional engineer is a person educated in the principles of mathematics and the physical sciences who applies this knowledge to direct and control the materials and forces of nature for the safe, economic use and convenience of man.

You can readily see the difference now between a scientist and an engineer. The scientist discovers the natural law, theorem or principle and the engineer applies it—makes it practical, safe, economical and usable. Many times, of course, the two capacities are practiced by the same individual.

There has been an awakening in the last several decades in our profession—a professional consciousness that there is more to engineering than just creating a gadget, machine, structure or bomb. There is the responsibility for us to analyze the impact of each creation on society. There is the requirement that we study the social sciences and humanities so that we may better understand man, his reactions and living habits. We feel that the benefits of our work should accrue to the people but we have (in the past) not been around to see that this integration is properly handled.

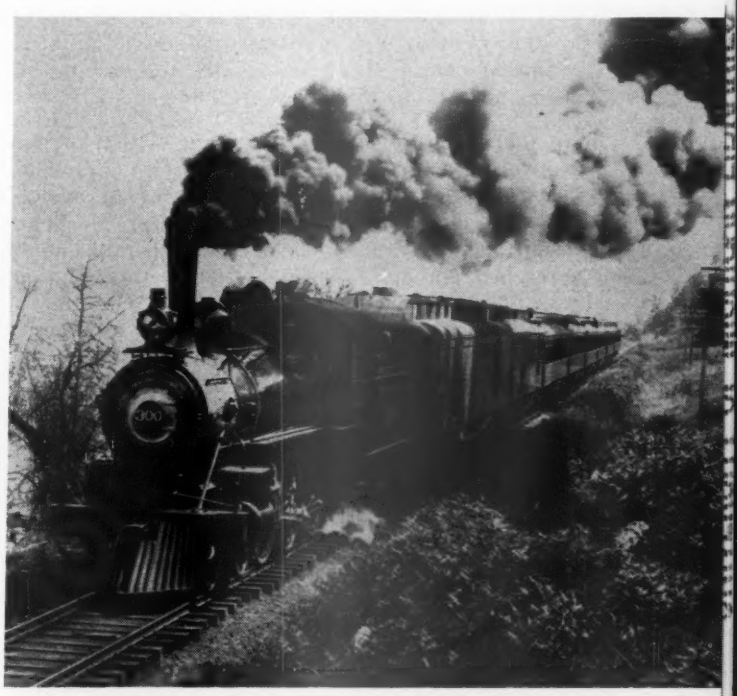
In other words, the engineer has not assumed his proper place in political, civic and management posts in order to see that serious economic and social unbalance were minimized by the work and efforts of our profession.

There is a genuine professional responsibility toward society which we must face.

Now let us quickly review a few illustrations wherein with only 5.2% of the world's land area and 6.8% of the world's population, the United States exceeds the rest of the world in the production of coal, iron, petroleum, silver, lead, zinc, synthetic rubber, and, we believe, atomic energy. The U. S. exceeds any other country in the world in the production of meat, cotton and tobacco; total railroad mileage exceeds 240,000 whereas, with more than twice the area, the U. S. S. R. has about 60,000 miles. Shipping exceeds 15,000,000 tons annually: and nearly a million miles of highways are reported of which half have been improved, and again, by comparison, it is reported that the U. S. S. R. has only 220,000 miles.

All of these staggering accomplishments have first been made possible by our form of government that has given encouragement to the individual's enterprise and woven neatly into all of the accomplishments is the engineer's

(*Continued on page* 33)



Wonders of different ages but both the engineers' work. Above: A Northern Pacific engine of 1900. Below: Clinton Engineer Works, Oak Ridge, where atom bombs are built.

THE ENGINEER-POWER PROBLEM

By F. W. Edwards, P. E.
Director, Department of Civil Engineering
Illinois Institute of Technology

THE manpower problem, particularly that part dealing with the supply of professionally trained engineers, is a serious one. It seems probable that certain fallacies, accepted as truths by the general public as well as by many professional engineers, prevent an objective analysis and a realistic solution at the present time. Three of these fallacies which appear to be generally accepted may be stated as follows:

a) Military manpower *alone* contributes to the defense of the United States.
b) *All* military personnel make greater sacrifices during war periods than civilian personnel regardless of the positions occupied by individuals in each group.
c) Professional manpower for research, design, construction, and production in essential industry *can* be obtained from the residue after *all* military requirements are satisfied.

In an attempt to promote understanding of some of the factors involved, a discussion of these fallacies is presented. The discussion is limited to that part of the overall problem which might be termed engineer-power. If a comprehension of the forces which block a realistic solution can be reached, perhaps a reasonably satisfactory solution finally will be adopted.

Victory in World War II was achieved only as a result of the extraordinary rate of production attained by the so-called arsenal of democracy. Without the production of enormous supplies of materials and equipment and the transportation on schedule of these supplies to many parts of the world, the allied military organizations could not have won their objectives. It is significant also that during the war period research scientists and engineers developed entirely new and improved facilities for use by the armed services.

Quoting from Vannevar Bush:[1]

"One of the most gratifying expressions of success of the scientific effort in the war is to be found in the attitudes of the Armed Services. Both Secretary of War Henry L. Stimson and Secretary of the Navy Frank Knox indicated their satisfaction over what joint efforts had accomplished in terms of operations. When the story can be told in full, it will be dramatic, and it will reflect the vigorous efforts of a great group of men, employing the best teamwork in the common cause. It will show without any doubt that the devices developed by American scientists and engineers played an important part in bringing the war to successful conclusion in a shorter time than might otherwise have been the case."

High rates of production, new materials, new methods, and new products resulted from the application of scientific principles and technical knowledge by trained engineers and scientists in many industries. The list of industries considered essential to the war effort in 1944 is imposing and illustrates the importance of these civilian activities. The list includes:

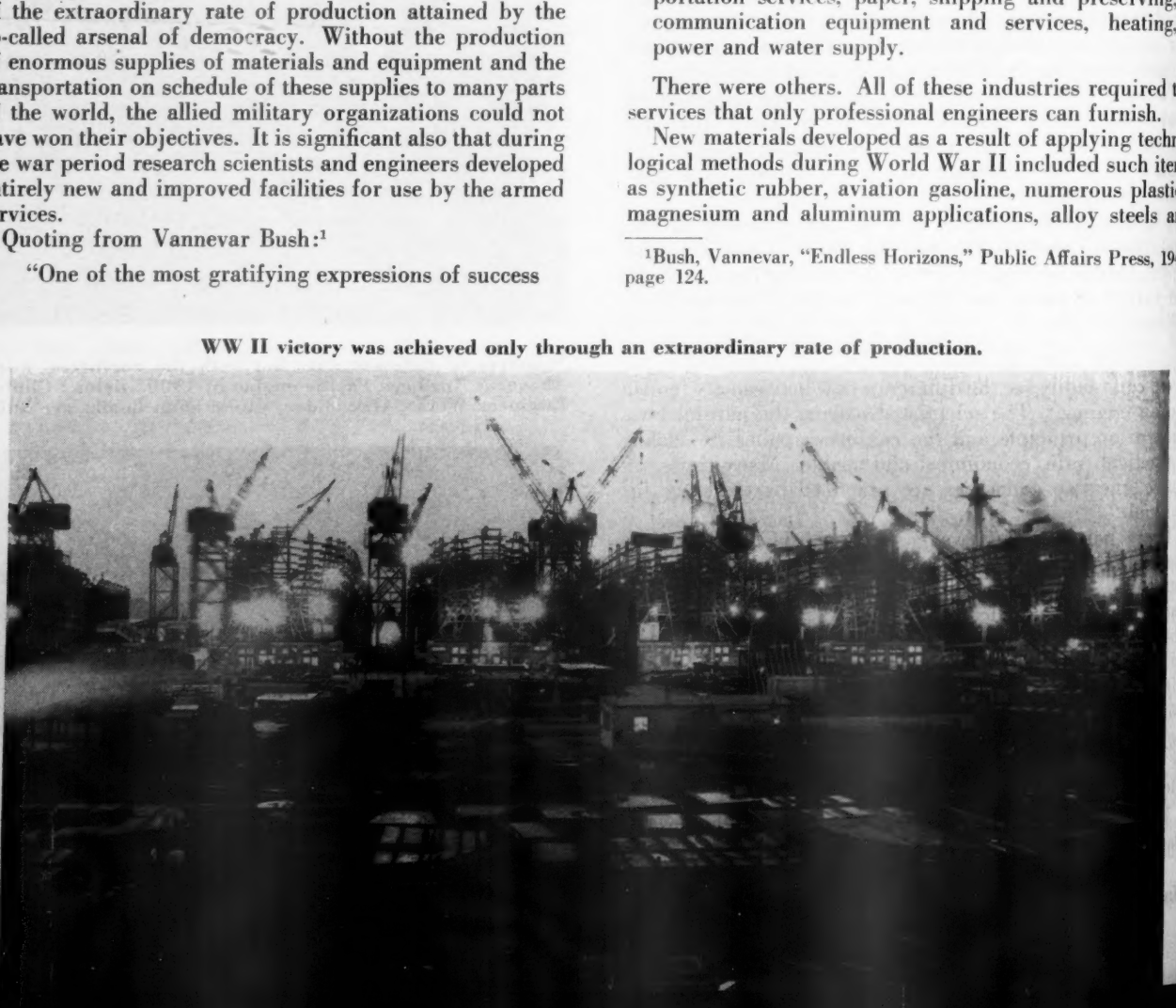
Aircraft, boats, ordnance, ammunitions, food processing, forest products, construction, rolling metal, metal shaping and finishing, coal mining, metal mining, smelting, refining, industrial and agriculture equipment, machinery, chemical and allied products, rubber, leather, textiles, clay, glass, petroleum, transportation services, paper, shipping and preserving, communication equipment and services, heating, power and water supply.

There were others. All of these industries required the services that only professional engineers can furnish.

New materials developed as a result of applying technological methods during World War II included such items as synthetic rubber, aviation gasoline, numerous plastics, magnesium and aluminum applications, alloy steels and

[1]Bush, Vannevar, "Endless Horizons," Public Affairs Press, 1946, page 124.

WW II victory was achieved only through an extraordinary rate of production.



plywoods. Discovery of new materials and new processes is only the first step toward development of finished products on an economical commercial basis. These and other materials could not have been produced in large quantities without the research, design, and production procedures developed by competent technical personnel.

In addition to the creation of new materials for economical production, engineers and scientists developed new methods and new products which were effective in building an invincible fighting machine. New methods included simplification of joining metal by riveting, welding, and stitching, metal spinning, powder metallurgy, centrifugal casting, continuous casting and metal spraying. New products included various types of aircraft, including those using jet propulsion, and appurtenances such as armament, bomb-sights and navigation devices. The gas turbine and electron microscope as well as radar and processed foods should be added.

BOTH military and civilian manpower contribute to the defense of the country. Professional engineers in essential civilian positions contribute in an unusually effective manner to a defense program. Again quoting from Bush[2]

> "There are great areas where civilian organizations can operate to better advantage, and this has been our accepted policy. The joints may creak at times, and there is bound to be confusion simply in view of the enormous magnitude of the job involved, but in general we get along faster when civilian organization produces the weapons with which the Army and Navy fight. The same advantage may be cited for civilian research and development, collaborating closely with the armed services, and meeting their needs as far as is physically possible, but acting with that flexibility and freedom which come from independent organization."

Possibly less tangible evidence can be cited to disprove the second fallacy. Individual experiences vary. No satisfactory reparation can be made for loss of life in the military service, nor for impairment of health or physical well being. Roughly ten per cent of the personnel in the armed forces in World War II were in this category. There is no intention of minimizing the sacrifices and the services rendered by this group which not only gave more than civilians, but more than their military associates as well. The fallacy is in the belief that *all* military personnel make greater sacrifices than those technically trained civilians who may be deferred for essential positions. It is true that many in the military service who were not in actual combat, also sacrificed much, both financially and otherwise. Many families had their lives uprooted. Homes were abandoned while wives and children lived with parents and grandparents respectively. In other cases the family followed the man in service from station to station and as a result was required to live in high cost areas under abnormally crowded conditions. Many cases of this kind are known.

On the other hand, it is well known, also, that many civilians working in essential positions were subjected to the same hardships and the same reduction of living standards experienced by the military men and their families. Furthermore there are many instances of individuals in the armed services who enjoyed better salaries, more responsible positions, and a higher standard of living than they experienced in civilian life. In many cases military and civilian personnel during the war worked side by side on the same product. It should be realized that many individuals in the military forces perform essentially civilian functions. A high percentage is in this category. At the peak of military mobilization in 1945 one-third of the personnel was stationed in the U.S. Supply and other necessary functions absorbed many of the remainder, thus reducing further the number actually located in combat areas. Numerous benefits accorded veterans since the war, without distinction between the types of military service rendered, further emphasize the belief that not all, or possibly even a majority, in the military service sacrificed more than a vast group of persons who occupied responsible positions in a professional capacity. The difference between the sacrifices made by military and civilian personnel must be judged on an individual rather than a collective basis.

(*Continued on page* 32)

[2]Ibid. p. 107.

Someone, says the author, must decide who is going to get the engineers that are available. Above: An engineer, left, inspects plane wheels. Below: Navy engineers carry out research at Antarctic camp.

Commerce To Aid Public In Guarding Technical Information

Secretary of Commerce Charles Sawyer has provided a service to help the public guard voluntarily against the harmful release of technical information, even though it is not subject to formal security restrictions.

The Office of Technical Services of the United States Department of Commerce will receive requests for advice as to whether specific technical data should be disclosed, withheld, or given limited distribution. OTS will obtain expert opinions from the interested departments and agencies of the Government and inform the inquirer promptly.

As an industrialist, businessman, scientist, public official, or private citizen, you are invited to use this service whenever you question whether technical information in your possession should be disclosed. It is then entirely up to you whether or not you act on the Government's advice. There is absolutely no compulsion for you to do so, since the program is entirely a voluntary one.

Requests for advice concerning the release of technical information, together with pertinent manuscripts, plans, or documents, if they are available, should be addressed to:

Office of Technical Services
U. S. Department of Commerce
Washington 25, D. C.

Your enclosures will be returned with the Government's comment as promptly as compatible with the problems of fact and judgment involved.

The program of voluntary protection is not primarily concerned with information which is "classified" as restricted, confidential, secret, or top secret by the United States Government. Unauthorized disclosure of such information is forbidden under penalty of law. If a question exists whether certain information is classified, however, this OTS service is available to obtain specific advice.

The program is primarily concerned with unclassified technical information of a technological nature. Information falling within the scope of the program includes unclassified technical data on:

Advanced industrial development
Production "know-how" and technology
Strategic equipment
Special installations

Circumstances in which voluntary protection is invited are somewhat broader than indicated by this listing. The public itself, through inquiries which already have been made of various Federal agencies, has showed its awareness of the dangers of divulging certain information. Those inquiries illustrate certain categories of information regarding which the advice of the Government can prudently be sought:

1. *Collection of data which individually might have little significance.*

   Example: A major railroad was asked to provide minutely detailed information on the physical lay-out of the system and an analysis of the flow over its lines. The stated purpose of the inquiry was to construct large maps of that and other rail systems. The railroad questioned whether the inquiry should be answered inasmuch as such a *set* of maps might constitute strategic intelligence of greatest importance.
2. *Information requested under unusual or suspicious circumstances.*

   Example: A supplier of ordnance received a questionnaire from a broker with respect to his facilities for performing Government contracts. The questionnaire appeared unnecessarily detailed for its stated purpose.
3. *Technical information as yet of limited general knowledge.*

   Example: A maker of electronics equipment asked whether a proposed radio broadcast on technological aspects of his product would be a security violation.

Oak Ridge Offers Course In Nuclear Reactor Technology

Industrial organizations interested in obtaining special training in nuclear reactor technology for experienced engineers in their employ are invited to sponsor their enrollment in the 1951-52 session of the Oak Ridge School of Reactor Technology. Application deadline is April 1, and the school term begins September 10, 1951.

Since much of the material presented in the curriculum of the Oak Ridge School of Reactor Technology will be classified, all enrollments are contingent upon a personal security investigation. Announcements of appointments will be in April.

Further information and application forms may be obtained by writing to the Director, Oak Ridge School of Reactor Technology, P. O. Box P, Oak Ridge, Tennessee.

OUR AUTHORS

George W. Clark, P.E., (Birds of a Feather—page 10), who is Associate Professor of Civil Engineering at Ohio University, Athens, Ohio, was born in Rio de Janeiro, Brazil in 1903. He spent 12 years of his youth in Brazil, being educated in Brazil, Portugal and the U. S. A.

He graduated from Wooster College in 1924 and from Case Institute of Technology in 1928, and received from the latter his C.E. degree in 1941. Before accepting a position on the staff of Ohio University he worked for the Rio de Janeiro branch of the National City Bank of New York, Jones and Laughlin Steel Corporation, the Pennsylvania Railroad and Republic Steel Corporation. He is an Engineering Consultant in Athens and vicinity on Surveying and Mapping.

Frank W. Edwards, P.E., (Engineer—Power Problem—page 14), is chairman of the civil engineering department at Illinois Institute of Technology.

After graduation from the University of Iowa in 1928 with a bachelor's degree in engineering, he received his master's degree in hydraulics in 1930.

From 1928 to 1932 he was employed by the Management and Engineering Corporation of Iowa in hydro-engineering and hydraulic research work, and from 1933 to 1946 he occupied a number of civilian positions in the U. S. Army corps of engineers. In 1946 he was named professor of civil engineering at Carnegie Institute of Technology, and remained there until he joined Illinois Tech in 1948.

He is secretary of the National Conference on Industrial Hydraulics, and has been named to assist in the planning of the Engineering Centennial Celebration for 1952 in Chicago.

SUPPORT PUBLIC RELATIONS FUND DRIVE

Accent on Activity

SINCE THE LAST AMERICAN ENGINEER PUBLICATION DATE nearly 1,000 more members of NSPE have contributed to the **PUBLIC RELATIONS FUND . . .** See story, page 18 along with NAMES OF NEW SUPPORTERS . . . **CONTRIBUTORS OF $5 or more, please note:** Manufacturers of Professional Engineers Auto Plaques advise more delays because of metal shortages . . . Small shipments are being received, though, and early contributors are getting them . . . **EVERYTHING POSSIBLE IS BEING DONE TO GET MORE PLAQUES.**

CRITICAL SHORTAGE OF ENGINEERING PERSONNEL (PRESENT AND FUTURE) RECEIVING NSPE ATTENTION . . . New booklet on opportunities of engineering profession has now gone out for State and Chapter use. **ANOTHER NEW PUBLICATION:** Registration information booklet is now off the NSPE HQS presses and being made available to States . . . It is attractive with white and green cover to replace old blue . . . **STATES SHOULD GET THIS OUT NOW TO COLLEGE SENIORS!**

STATE PRESIDENTS' CONFERENCE IN WASHINGTON, March 2 & 3 is popular topic as we go to press . . . final plans being made for briefing on defense effort for the officials by the **Department of Defense** plus several talks by name speakers . . . rest of time (day and night) will be devoted to mutual problems of running a State Society.

ENGINEERS' WEEK WAS GREAT SUCCESS FOR A FIRST EFFORT . . . Plans already being laid for MUCH MORE EXTENSIVE celebration in '52 . . . NSPE has already been promised full cooperation of some of Nation's largest industries . . . Some stories on EW in this issue but many too late for deadline . . . April issue will carry more stories . . . **CHAPTERS ASKED TO SEND EW STORIES TO HQS FOR PUBLICATION IN MAG.**

8,365 BALLOTS RECEIVED BY HQS . . . They have been passed on to Tellers Committee who will report final results to Society officials.

HQS OFFICIALS THANK THOSE WHO HAVE SENT IN DATA CARDS . . . Others who received cards with ballots are asked to **FILL IN CARDS AND MAIL NOW . . .** They serve many purposes at Hqs.

NSPE COMMITTEES ARE ACTIVE COMMITTEES! . . . NATIONAL AFFAIRS COMMITTEE held meeting in Cincinnati, O., recently after being called together by Stephen G. Szabo, Chairman . . . **MEMBERSHIP COMMITTEE,** William F. Ryan, Chairman, and **PUBLIC RELATIONS COMMITTEE,** C. G. Roush, Chairman, plan meetings during State Presidents' Confab in Washington . . . **YOUNG ENGINEERS COMMITTEE,** Col. Chester Lichtenberg, Chairman, is producing. Committee has secured papers written by six young engineers re: their problems. Group has also compiled list of prominent engineers who will act as counselors for young engineers.

AWARDS COMMITTEE, L. L. Dresser, Chairman, has set **APRIL 1 as DEADLINE** for State Societies to forward their nominations for **NSPE Outstanding Engineer Award.**

Executive Director Paul H. Robbins appointed to a committee of the American Society of Photogrammetry to study ways and means of securing registration of qualified photogrammetric engineers.

AROUND THE NATION WITH NSPE OFFICIALS . . . President S. L. Stolte has appeared before the **ILLINOIS AND KANSAS** groups in past few weeks . . . Ex. Dir. Robbins talks to **MINNESOTA** meet, at Virginia Polytechnic Institute, and at joint meeting of Southern Pennsylvania Chapters at Lancaster, Pa.

Nearly 3,000 Contribute To Public Relations Fund; Committee To Meet March 2

With more than 1,000 additional members supporting the Public Relations Fund Drive during February, the total number who have contributed to date approaches the 3,000 mark. Here are other late developments:

1. C. G. Roush, PR Committee head, has called for a meeting of Committee members J. D. Skinner, A. C. Neff, H. Rickenbach, H. H. Funk, C. E. Thompson, and B. P. Barber, during the State President's Conference in Washington on March 2.

2. The second mailing piece asking for the support of the Society membership is mailed from Headquarters.

3. National Headquarters announces that Professional Engineers' auto plaques are being distributed to contributors as soon as they are received from manufacturers.

4. Thirty-two members have contributed $25.00 or more to the Fund since the first of the year, and will receive Dr. D. B. Steinman's famous book, "Builders of the Bridge," through the generosity of the author.

As the PR Fund Drive gained new momentum, Committee Chairman Roush asked the full committee to come to Washington to review the entire Drive up to the present, and to chart a future course for implementation of the 4-point program.

"We want to give the members some concrete evidence as soon as possible that we are ready to go on a real public relations program," Mr. Roush said in discussing the coming meeting. "We have had many excellent ideas from both our members and professionals in the public relations field, and we feel that it's time to get the Committee together for a look at the complete picture."

Additional Contributors to the P. R. Fund

ARIZONA
George M. Burgett
Donald F. Carter
James E. Hastain
Clyde Walbridge Horton
Lloyd E. Martin
Benjamin McLain
Ralph L. Motz
Capt. Marshall A. Patch
H. T. Pearson

ARKANSAS
George F. Branigan
Harold Engstrom
O. M. Fairley
Fred J. Herring
Charles E. Malone
William L. Maschmeyer
D. D. Ricketts
George H. Scott
E. L. Wales

CALIFORNIA
A. F. Broz
Ray F. Bunnell
F. J. Carpenter
Hjalmar A. Eriksson
Roy E. Fredricksen
Carl M. Heynen
Harold M. Horner
F. H. McLaughlin
C. K. Sencebaugh
Felix A. Wallace
O. E. Warburg

COLORADO
Richard F. Price
W. C. Rhoads
Alfred J. Ryan
Jack A. Speyer
G. G. Symes
Arthur F. Weers

CONNECTICUT
Robert S. Aries
Joseph Coel
Allen Hubbard
Frank R. Laney
Louis Lichtenstein
A. L. Pierce
R. F. V. Stanton
Adam A. Waligoski
John C. H. Wendes

DELAWARE
John L. Bahr
Clarence H. Evans
Harry L. Maier, Jr.
E. Powell Smith

DISTRICT OF COLUMBIA
Leo H. Cleary
Walter DeFries
Edward A. Hindman
Vincent T. Manas
V. J. Richter
Stanton Walker

FLORIDA
E. A. Anderson
Trice M. Bell
Jesse V. Boyles
Richard Wenuell Clouse
William D. Cromartie
George L. Dickenson
H. J. Harrje
C. D. Hartman
Joe W. Hawkins
John E. Kiker, Jr.
Jacobus L. Mauritz
Herbert McClammy
Lynn Perry
Selden L. Stewart, II
Stanley Warth
Ernest M. Watkins

GEORGIA
Will H. Artley
Joseph G. Attaway
Julian J. Attaway
F. E. Baird
George A. Belden
Arthur S. Booth
Francis M. Brannen
Karl W. Brittain, Jr.
Harry O. Buman
H. K. Burns, Jr.
L. Ralph Bush
Sylvan M. Byck
R. B. Cayce, Jr.
H. N. Daniel
Eugene B. Dawson
James L. Dukes
Thomas C. Earl
Milton F. Eisenberg
F. H. Elsom
Frank L. Etchison
Cecil L. Fife
Simon Fogarty, Jr.
Hockley M. Garmany
Andrew J. Glenn
A. S. Goebel
William M. Griffin, Jr.
William V. Hadsell, Jr.
B. M. Hall, Jr.
L. L. Hamptom
Carl E. Helfrich
Richard C. Houstoun
Ralph S. Howard
Joseph J. Hutton
James E. Hungerpiller
John F. Inglesby
Hugh H. Jackson, Jr.
Robert A. Jewell
T. A. Jones
W. P. Kennard
R. J. Kennedy, Jr.
Eulas H. Kemp
William H. Kubler
Edward H. Lannon, Jr.
William H. Leavenwood
Joseph A. Logan
William S. Lovell
William J. Lynch
John Arthur M. Maddox
Robert S. McArthur
J. Lennon McDevitt
Carroll B. McGaughey
Albert W. McKay
M. R. McKenzie
Robert K. McKinnon
E. P. McLean
R. B. Miller
William Henry Mims
W. Lee Mingledorff, Jr.
Alex C. Ormond
Olaf Otto, Sr.
W. W. Prim
D. Wilkey Rabey, Jr.
R. L. Rentz
Ralph F. Rhodes
Harry C. Roberts, Jr.
Jack B. Roberts
Louis C. Roesel
George G. Scofield
James Patrick Sheehy
Morris Sherry
Charles Somers
Eugene A. Stanley
Gerard Swarthout, Jr.
George R. Terry
Huguenin Thomas, Jr.
Charles G. Trowbridge
Roy A. Watters
Paul Weber
William A. Wells
John G. Wheatley
John Daniel White
W. S. Wilson
Thomas H. Winchester, Jr.

IDAHO
Robert E. Baird
Archie L. Biladeau
T. C. Butler, Jr.
Herbert C. Clare
Samuel D. Clinton
Elton L. Leitner
Orland C. Mayer
Harvey J. Smith

ILLINOIS
M. E. Amstutz
Duncan M. Campbell
Wendell M. Carlson
Andrew R. Coude
F. W. Edwards
Stephen Evanoff, Jr.
J. A. Fensterle
Hugo Edward Fischer
Winfred D. Gerber
Robert H. Harmeson
Gilbert D. Henning
Herschel D. Hill
Spencer J. Johnson
Robert M. Kastner
Frank A. Koerner
W. N. Lauer
D. H. McAnally
Robert F. Milligan
James P. Murphy
Daniel L. Oslund
Louis S. Pappmeier
Edward L. Reiter
Henry A. Riedesel
R. W. Robinson
Rob Roy
Charles J. Starr
J. S. Stein
Carl Wessel
LeRoy E. Wright
Edward N. Wyman

INDIANA
Herbert A. Bogard
George H. Christophel
Buell E. Clathworthy
Joseph G. Cors
Carl A. Cozzi
Arthur W. Howard
Robert E. Hutton
A. E. Kemmer
Arthur E. Krick
Claude E. Noble
A. A. Potter
Blair A. Rieth
Lewis E. Roberts
Howard Stech
Elmo E. Stuckey
Gordon B. Thompson
Ralph B. Wiley

KANSAS
Gafton L. Colgin
Harry Darby
Mike P. Dinkel
Walter D. Guy
Walter Johnson
Harold B. Russell
C. H. Scholer
Malcolm M. Steele
Frank E. Willey

MARYLAND
James Robert Cassell
James Clericuzio
Arthur M. Gompf
H. Melvin Harris
George F. Healy
William H. Marean
William Harvey Mitchell
Edward J. Morris
Karney K. Murdichian
Edgar C. Rogers
William G. Robertson, Jr.
William H. Staylor
George William Stephens
W. R. Suda

MASSACHUSETTS
Herbert H. Anderson
Raymond A. Anderson
Fred W. Arnold
Frederick S. Bacon, Jr.
Samuel A. Balkan
W. Nielson Brownlie
Leslie M. Buckingham
Lawrence S. Burke
George W. Carter
Fred W. Cass
Donald Cockburn
Fred C. Cosman
William H. Fitzgerald
Thomas G. Gallagher
Henri D. A. Ganteaume
Bertrand Giegerich
Frank E. Gowdy
F. M. Gunby
L. L. Hamilton
Robert William Haskel
Henry L. Kennedy
Louis W. Kirmes
Paul Lebenbaum, Jr.
Herman G. Libby
M. J. Lowenberg
Ed. Lynch
Dewey A. Peterson
Waldo F. Pike
Albert E. Pouah
J. P. Putman
D. T. Richardson
Anthony A. Rondo
William F. Ryan
Bernard Schneider
Stanley J. Slater
T. R. Walters
Raymond R. Wisner
Henry B. Wood

MICHIGAN
G. J. Bates
John V. Vanden Bossche
Fred M. Cousins
M. D. Crandall
Clarence T. Fishleigh
Dale W. Granger
R. W. Hautzenroeder
Joseph R. Henninger
Frederick T. Hicks
Elmer M. Jewell
Alex M. Krzyminski
James P. Laughlin
H. S. LeDuc
Harry G. Lienau
Frank H. Clingan
Roscoe J. Mason
Frank W. Miller
Dudley Newton
Curtis L. Roop
K. Seidel
Peter Sfat
C. L. Shattuck
Leopold T. Szady
Virgil C. Wagner
Edward R. Wilson
D. J. Zabner
Herbert E. Ziel

MINNESOTA
E. Maurice Adams
Dean M. Anderson
Gordon S. Anderson
C. A. Armstrong
William H. Bachelder
A. W. Banister
George T. Beardshear
S. E. Blunt
E. R. Boyce
Clifford A. Brandt
Henry R. Bray
Julius H. Brown
Frank P. Bruce
Thomas J. Burns
Howard F. Bussard
H. R. Chapin
Kenneth M. Clark
Wilmer F. Clark
George A. Claydon
James A. Colvin
E. W. Downward
W. Edgar Edwards
A. H. Engebretson
Ralph N. Forsberg
Bertram Getsug
Roy A. Gilbertson
L. W. Grace
W. Bix Griebler
M. B. Haase
N. William Hamlin
Charles K. Handschu
William C. Hendrickson
Edward E. Hogeland
Francis W. How
George R. Jones
Myron L. Jones
William S. Kelley, Jr.
F. J. Kilpatrick
Edward F. Kishel
Arvel B. Klessig
C. B. Knowles

J. A. Lang
A. C. Larson
John S. Loye
F. J. Magnuson
Richard A. Mann
Fred R. McComb
Kenneth M. McGhie
Harold E. McWethy
A. L. Meger
F. S. Morgan
Floyd L. Muchlinske
R. L. Nelson
John F. O'Meara
Lyle W. Pantzke
Myhren C. Peterson
O. J. Pfeifer
Knox A. Powell
C. H. Prior
Walter Pullen
Loyd Quarve
R. K. Redin
J. S. Richmond
C. N. Robertson
E. J. Rowland
E. O. Shultz
Judson P. Smith
Gilbert J. Sullivan
E. S. Sweeney
Edwin C. Swenson
G. C. Torgerson
C. W. Turnell
Sherman J. Wagnild
Elmont C. Ward
Herbert S. West
Reuben C. Wieseke
W. P. Wolff
Claude R. Zehetner

MISSOURI
Howard E. Clements
Mark C. Culbreath
J. R. Ellis
Kenneth K. Ellis
A. R. Elsperman
Edward P. Evers, Jr.
B. J. George, Sr.
Edward E. Gilcrease
Walter E. Gillham
C. Mitchell Hall
Glen E. Hands
A. F. Hartung
Walter A. Heimbuechu
Robert W. Hodson
Alan J. Hoener
Paul R. Hoffmann
M. J. Horney
C. Grover Johnson
Robert L. Johnstone
Russell G. Kincaid
Emil P. Kronsberg
Kenneth H. Larkin
Ben. T. Marshall
A. C. Mayer
Reed McKinley
Lamar W. McLeod
Robert W. Mellis
Carl H. Mueller
F. H. Pietzsch
Walter P. Rathell
K. C. Raydon
E. S. Rehagen
Otto S. Reynolds
W. G. Riddle
Bert Robbins
J. H. Schmall
W. C. Steinheimer
Earl J. Thomson
Robert E. Welsh

NEVADA
Louis W. A. Bunge
Lt. Col. Kern H. Copeland
W. O. Haynes
A. T. Newell

NEW JERSEY
Robert B. Anderson
William R. Andrews
Achilles F. Angelicola
Francis W. Atkinson
Gustavus Auer
John Berner
Howard F. Blum
Joseph Andrew Boyle
Solomon Breene
Clarence S. Briggs
Martin Christesen
H. T. Coates
Robert E. Crockett
Anselm De Ghetto
John P. De Pol, Jr.
George S. De Puvy, Jr.
J. Cleaver Diament
Harold A. Dietler
Harold E. Deiller
Falcone Engineering Inc.
(Chas. E. Falcone)
Frank P. Francia
C. W. Garrison
H. S. Germond, III
Murray J. Goldwasser
William J. Grady
C. V. Guerin
William T. Harker
Frank Hollenton
Andrew G. Hult
Jacobus Joosse
Michael S. Kachorsky
William R. Kent
Paul A. Ketchpel
Daniel M. Kramer
Karl J. Lamp
Stanley Lenox
Isaac Levine
Walter E. Lobo
James Logan
Scott Macan
H. A. Martin
Samuel Masker, Jr.
Joseph N. Mastronardi
Robert W. McKelvey
Joseph J. Moro-Lin
William B. Neill
Clyde L. Nordheimer
Stanley J. Ozimek
George B. Peters
James Pipines
Ellwood D. Powers
Peter E. Pranis
Guido Rohn
Lewis E. Saxby
Carl H. Schlachter
J. I. Somers
Richard M. Somers
Charles Bates Stecker
Bernard H. Strouse
John E. Studer
Moses H. Teaze
M. Joseph Truscott
Arthur H. Whysall
E. H. Wickland
Wilbur J. Winward
Karl H. Wilber
M. Arthur Wolf

NEW MEXICO
W. E. Bostwick
William Chauvenet
E. B. Van de Greyn
Hugh James Hall, Jr.
John D. Josey, Jr.
Charles Morris Stokes
Jesse E. Williams
Harrison Alex Yazhe

NEW YORK
Harold G. Abbey
Irving Adelson
John Balint
Edmund A. Barber
Robert H. Barclay
Sydney G. Berliner
Fred J. Biele
Karl Bloch
William C. Bowden, Jr.
Joseph A. Brady
Fred C. Brandes
Joseph A. Brunner
M. A. Buckley
Edwin S. Bundy
Carl Bussow
George F. Butler
William H. Byrne
Cecil I. Cady
L. Coff
Isadore M. Cohen
Lawrence M. Cook
Tom S. Cowen
William Crepea
George E. Dana
H. M. Davidson
Thomas C. Desmond
Glen H. Dewey
E. E. Dittbrenner
Oscar A. D'Iuhosch
Arthur Ehlers
Alexander M. Emerman
Kenneth A. Epstein
A. C. Foster
William A. Fouhy
A. L. R. Francisco
Myron F. Freeman
Donald C. Fuller
A. A. Gassner
Carl M. Gilt
Theodore Green
Kurt Groepler
Murray W. Harris
Raymond C. Hauser
Harold T. Havill
Howard S. Hougland
William N. Hudson
Richard V. Hyland
William A. Janos
Jacques Jansen
William D. Jordan
Gust. H. Karlsteen
Arthur H. Kehoe
Ernest Kaiser Kending
Paul Klepper
Frank S. Korona
Everett S. Lee
Emanuel M. Lindheimer
Walker B. Lounsbery
Kraemer Luke
Arvid Lundquist
Stanley B. Lyons
Lloyd A. Martin
William Mayhew
Charles B. Molineaux
George J. Nicastro
Frederic Nicholson
A. H. Okun
Conrad Pantke
William E. Paul
C. G. Plomasen
Blaine Potter
Edward F. Powalski
Stephen J. Reid
Macdonald Ronald
Samuel W. Ross
Franklin W. Saunderson
Louis Schleimer
William A. Schuerman
Joe Patrick Shecky
Norman N. Silverman
C. S. Stratton
Artro W. Swingle
C. H. Taylor
James D. Taylor, Jr.
Howard J. Teas
Albert Tepper
H. R. Towse
Edwin S. Tweedy
A. Sol Uman
D. J. Vaccaro
C. W. Valentine
Roland M. Watkinson
Harold W. Watt
William L. Wenzel
John R. Wesel
S. Griffin Wiss
Richard L. Wood
Arthur Young

NORTH CAROLINA
Arthur H. Barber, Jr.
M. E. Beatty
William G. Brown, Jr.
Guy J. Fisher
David M. Mackintosh
Bodwell D. Osborne
C. Bernard Scott
Martin Swartz
William Emite Viverette
John D. Watson

OHIO
Lester L. Bosch
William S. Campbell
Lloyd A. Chacey
Stephen Arthur Derry
H. C. Gallimore
Fred Gaub
Miss Jo Godley
Edward F. Gullen
Thompson F. Hindman
R. R. Hollopeter
Edwin H. Huston
John M. Kidd
A. W. Kimmel
Kenneth A. Lynn
William Henry Miller
Al Neff
H. A. Roselund
John B. Scalzi
James L. Sherwin
D. R. Terill
William T. Weinhardt
Karl Yost

OKLAHOMA
Julian C. Brown
James B. Davis
Raymond G. Dolan
L. W. Fagg
David R. Graham
Richard E. James
Douglas O. Johnson
C. A. Lashbrook
Clarel B. Mapes
M. J. Peterson
Ray Pool
George J. Stein
B. G. Thacker
Clyde Wallen
W. R. Wolfe

PENNSYLVANIA
Anker K. Antonsen
Michael Baker, Jr.
A. F. Jones
C. L. Kreidler
Ritchie Lawrie, Jr.
Wm. K. Leigamann
J. W. Magoun
J. Edward McGrath
Theodore F. Rockwell
Herbert A. Russell

RHODE ISLAND
Vincent DiMase
Matthew J. Kulick

SOUTH CAROLINA
E. D. Fry
L. L. Paxson

TENNESSEE
Robert P. Farrell
K. E. Hapgood
John B. Harirson
John S. Herbert
Paul Kennedy
W. F. Moehlman
D. R. Shearer
J. L. Simpson, Jr.
Wayne L. Smith
Billy T. Sumner
P. A. Williams, Jr.
Ernest Zurcher

TEXAS
G. W. Ashford
R. W. Barnes
R. B. Bevan
J. H. Biddison
George M. Brady
A. Chetham-Strode
Ira D. Clarke
Jack K. Covington
O. L. Crain
W. Mack Crook
Kenneth W. Damerow
Alexander Saussen
E. C. Drumb
F. B. Elmore
W. H. Garrett
Paul D. Gregory
Henry Harkleroad
W. D. Harris
James M. Hartsfield
W. F. Hicks
H. D. Hilborn
James H. Howard
H. E. Howe
Noah E. Hull
Bernard G. Johnson
J. Mack Jones
T. M. Keiller
Robert W. Kelley, Jr.
Warren A. Kincheloe
R. E. Killmer
George R. King
Robert A. Krocker
J. W. Lacy
Ersel G. Lantz
S. K. Mason
Winfield A. McCracken
J. Q. McGiffin
Richard T. McKay
John R. Miller
Leland E. Miller
Paul F. Miller
W. Leon Montgomery
W. E. Neill
D. D. Nixon
R. F. Nowlin
D. L. Olson
Raymond E. Pechacek
L. A. Peterman
A. H. Preston
Joseph J. Rady
R. D. Rickette
E. W. Robinson
John F. Rother
J. Howard Samuell
G. S. Sawyer
Sylvan B. Schapiro
Elmer F. E. Schmidt
Max A. Schumann, Jr.
R. C. Stokes
C. V. Thornton
N. P. Turner
J. F. Van Gorder
E. E. Walters
Frank S. Walters
Miles Frank Wortham
Harrold E. Wright
F. Zapffe

VIRGINIA
Bereram D. Aaron
Hyman J. Fine
C. H. Hinnant
George E. Langley
J. H. Poladian
Troy Alvin Smith
George J. Viertel
E. J. F. Wilson

WASHINGTON
L. R. Durkee
Charles K. Ittner
Conrod O. Mannes
C. W. May
Keith K. McDaniel

WEST VIRGINIA
S. H. Bridge
Charles C. Davis
L. A. Fugassi
L. A. Hornby
William L. Kaiser
Alfred D. Longhouse
Horace A. Lovelady
C. H. Perry
Patrick J. Urso
C. B. Seibert
R. C. Shutts
Joe F. Skaggs
Joe A. Spence
William C. Strasser
George W. Zimmer, Jr.

WISCONSIN
Donald C. Bengs
Karl A. Blind
T. A. Brown
W. N. Brown
R. F. Burt
Carl A. Cajanus
Frank M. Charlesworth
S. S. Cohen
Robert W. Connelly
W. S. Cottingham
L. A. DeGuere
Clyde R. Ethier
Harry S. Fullwood
Rudolf R. Gocht
William T. Gohn
Robert E. Greilng
Robert D. Hall
Wallace R. Harris
Bruno J. Hartman
Leo J. Jeselun
E. J. Kallevang
Daniel T. Kottke
L. J. Klug
Leo F. Kosak
A. P. Kuranz
Henry Olk
C. H. Perry
John O. Pharo
Wilbur H. Rudolf
George A. Sievers
George V. B. Sirotkin
LaRue H. Stark
B. J. Sunny
Harold C. Trester
Fred C. Trubshaw
W. Hall Wallace
Earl F. Walter
Howard R. Waters

MEMBERS AT LARGE
L. W. Kehe
L. S. Linderoth, Jr.
Waldo L. Scott
R. C. Setterstrom

PUBLIC RELATIONS FUND RAISING CAMPAIGN

Yes, I want to do my share toward building a greater engineering profession. I enclose $..... toward the Fund. I understand that everyone contributing $5.00 or more is to receive free the metal Professional Engineers Plaque suitable for attachment on an automobile.

NAME .....

ADDRESS .....

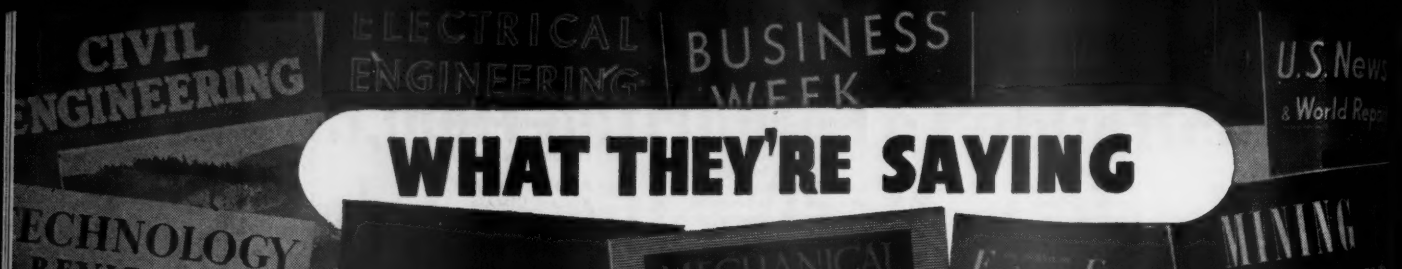
CITY ..... STATE .....

CHAPTER .....

(Please use correct Chapter name)

STATE AFFILIATION .....

(Be certain to PRINT all information asked for above. Include correct Chapter name so the group will receive credit for your contribution.)



DEMOCRACY—FOR WHAT?

It has frequently been stated that for two important reasons engineers must sense a disportionately high degree of civic consciousness. First, because the complexity of life today stems largely from the mechanical era for which the engineer must feel a major share of responsibility. Secondly, because of his training and professional environment, an engineer is accustomed to making decisions based on reason rather than on emotion or guesswork. He is eminently conditioned mentally to expect certain predetermined results, given a set of conditions. However, engineers must be cautioned against assuming that problems involving people can be solved just as exactly and as easily as the technical problems of their professional world.

Neglect on the part of engineers, as well as others, to assume the obligations of citizenship probably stems from their failure to see clearly the answer to a very simple question. Why must a vast majority of the citizens take part in civic affairs in order to make a democracy succeed? Failure to learn the answer to this question is perhaps the greatest single danger to freedom.

A democratic nation is the result of the beliefs of people, the acts of people, and the struggles of people, starting years, even centuries, before democracy becomes a fact. Likewise, the fall of a democracy is the result of the behavior of the people. No society remains unchanged regardless of the character of its members. These statements are accepted as true by almost everyone, but so often each individual fails to see himself as a positive part of the society in which he lives. He overlooks the fact that his action or inaction is helping to decide its future growth or decline. Citizens of a democracy are inescapably voting virtually from day to day on the future of their society. The little failures on the part of each one to assume responsibility when the occasions arise are votes against the freedom of all. When the votes of apathy, stupidity, and immorality gain a majority, democracy fails. The certainty of this is sure as any physical laws that engineers recognize.

The degeneration of a democracy is slow and not immediately perceptible. In fact, the degree to which any particular citizen is responsible for this decline is hardly measurable. We need never become alarmed by radical movements whether colored to the Left or to the Right, provided a preponderant majority of the citizens sense their civic responsibility, educate themselves in the problems involved, and perform such duties as their consciences dictate. An apathetic citizenry provides fertile ground for both political corruption and governmental incompetence. Full comprehension by each of us that "eternal vigilance is the price of liberty" will defeat more subversive movements than all the laws of government could enact.

Is it not tragic that it becomes necessary to plead with people that they recognize their responsibilities as citizens? Freedom can be attained only through the efforts of people—*all* the people. The motivation that brings men to work and sacrifice in order to maintain freedom must be one derived from enlightened selfishness and hardheaded realism. There is no sound basis for one to feel that he is high-minded and self-righteous when he undertakes to shoulder his civic responsibilities. He and his children stand to benefit as much as anyone from these efforts.

It is easily understood, therefore, that democracy is the most difficult form of government to practice, but its rewards are by far the greatest. In order to comprehend their full value we must continually measure them against history's record of the despair of the enslaved. It is easy to lose one's appreciation for that which he has in abundance. We can "secure the blessings of liberty to ourselves and our posterity," if we will only heed the laws of human conduct as we engineers heed the laws of the physical world.—*P. W. Nordt, Jr., "Mechanical Engineering," January,* 1951.

POINT FOUR AND THE ENGINEER . . .

The engineer obviously has an important place in the Point 4 program since engineering provides for the initial development of natural resources and lays the foundation for other technical progress. Highways and railroads must be built, airfields layed out, and water supplied before modern industries can profitably develop. In the Point 4 program the engineer is needed as a leader and planner as well as a technologist.

Of course American engineers in business organizations and private foundations have furnished technical assistance to other countries for a long time. Many manufacturing, mining and petroleum industries, as well as the Rockefeller, Carnegie and other foundations, have world-wide organizations. The value of other supplemental technical Point 4 activities has already been demonstrated in South America by branches of the government such as the Institute of Inter-American Affairs and a number of offices working through the Inter-Departmental Committee on Scientific and Cultural Development.

The Institute of Inter-American Affairs and predecessor agencies have expended $58,953,000 for field programs from 1940 to June 30, 1949, not counting the funds supplied cooperatively by the Latin American republics. The IIAA has an impressive record of accomplishment in its three divisions of agriculture, education and health and sanitation. In cooperative health and sanitation services, the Institute employs some 8,000 doctors, engineers, nurses and other personnel, approximately 120 of whom are from the United States. There are 550 specific projects now being carried out in 14 Latin-American countries.

Of the previously mentioned total spent by the IIAA in the last ten years, $46,443,000 has been expended by the Health and Sanitation Division.

Besides normal public health activities, the Institute's engineers have been involved in the design and construction of water supply and sewerage systems. Other health facilities, such as

hospitals, health centers, abattoirs and other buildings have also been constructed.

Each republic places emphasis on the types of projects desired to meet particular local needs and conditions. In Venezuela, the development of safe water supplies is considered of paramount importance; in Chile a sewerage system was built for a metropolitan district of 200,000 people; and in a large valley in Brazil, typhoid fever and dysentery have been practically eliminated. Often consulting engineers are hired by the Institute to assist in the development of particular works.

In addition, from 1940 to 1948, over 1,550 U. S. Government experts were sent to the American republics by the Inter-Departmental Committee on Scientific and Cultural Cooperation. These experts worked on specific technical cooperation projects which varied from sanitary and public health engineering to geological surveys, soil conservation, airfield location and construction, highways, multiple-purpose water development, port and harbor development, railroads, statistics, shelter and urban planning, tele-communications, and so on through a host of non-engineering activities.

Similarly the United Nations has been active in sending out consultants to advise requesting governments on specific problems. The UN Food and Agricultural Organization Mission in Asia assisted in demonstrating soil utilization, pest control, and fertilizer manufacture. Similarly the UN World Health Organization has reduced the prevalence of malaria in Greece and has developed an over-all program involving engineering activities in such fields as environmental sanitation, research, and malaria control. The International Civil Aviation Organization, the International Telecommunications Union, the International Bank for Reconstruction and Development, and other international agencies, also have working projects and are obvious sources of specialized technical assistance. For Point 4 work, however, the UN is the agency to be utilized whenever efficiency indicates the advantage of such cooperation.

On a long-term basis the contributions of private U. S. groups have been much larger than those of U. S. Government agencies. The Point 4 program should provide a stimulus to expand such private activities. Wherever appropriate, the U. S. Government will utilize the services of consulting engineers on a contract basis for surveys and investigations as well as for construction and other economic development in connection with projects of Point 4 type.—*Ralph Stone, Civil Engineering, October,* 1950.

MUSIC AND ENGINEERS . . .

Music is a language expressing human thoughts, human aspirations, fears, and hopes through the Ages in organized and concentrated form. You may call it a combination of imagination and higher mathematics. Because it is universally and eternally human, it is a language open to everyone and all. To say, "I don't like music," is as senseless as saying, "I don't like trees." To say, "I don't understand music," is no more than admitting, "I cannot follow the groping of science for the mysteries of the universe." Being puzzled by music need not be more alarming than being involved in the endless search for an explanation of man's behavior, his actions, and his ideas about the state of life and death.

The only trouble with this language of music is that it cannot be translated. An artist chooses his own medium, and if the message contained in a piece of music could be better or more convincingly expressed in a painting or in poetry, the composer would not say what he has to say in music. There are, of course, basic similarities in the main thoughts and problems presented during any particular period of history by its fine arts, its music, its literature, its philosophy.

Now if we can agree on the importance of music as a link in the chain of the humanities, as a thing in itself, and ever-present throughout history, there remains the question how to keep music alive and strong in our engineering institutions. I believe that there are avenues open, at least to engineering schools, and the problem is constantly to improve "traffic" on these avenues.

I should put as first in importance the creation of a musical environment. I believe that a technological school should include among its books the serious biographies of the great composers, music encyclopedias, histories of music, together with books of English literature, history, fine arts, fiction, etc. I also think that opportunities to listen to records in a quiet room should be made available to all students.

Finally, in creating a musical environment I would suggest arrangements for more or less formal concerts of *live* music in the school itself.

Extracurricular activities are the second avenue of approach towards music for the engineer. You would never believe how much enthusiasm, talent and skill exists among young Americans, especially among those whose mental curiosity and searching minds drive them to study science and engineering, until you have given them ample opportunities to make music in their free time.

Incidentally, the recreational aspect of extracurricular music is frequently sadly neglected because one assumes that fun and recreation are incompatible with concentration and hard work. While it is granted that athletic activities, demanding the last ounce of energy from the participants, are healthful; and that concentration in playing chess, and sweat in building a boat or a cabin are fun—in music one frequently takes dabbling in Gilbert and Sullivan or reclining on a couch while listening to the radio or phonograph for the happiest state of enjoyment and recreation. I would rather claim that the straining of one's concentration and energy in singing Bach Cantatas or Handel's *Messiah* is the healthiest mental and physical recreational occupation for those whose studies and professional training tend towards scientific specialization.

It should not be forgotten that it is an important social boost for engineering students to be able to join liberal arts girls' colleges in singing and playing the world's greatest choral and orchestral music.

I am glad to say that our music course at M. I. T. is known as a stiff course. Although requiring no previous training or experience in music, yet it demands concentration and much active preparation and cooperation on the part of the student. There are quizzes — and students have flunked the course.

No matter how elementary the initial presentation, when dealing with Technology seniors, the instructor in music will find himself thrown into a discussion of complicated twelve tone theories or contradictions in the traditional musical concept of harmony whenever and wherever questions have been encouraged. There is no alibi for the music instructor in a Technological school by way of saying, "For this you need first two years of harmony and counterpoint." Nor is it acceptable to describe great music in merely aesthetic and fashionable terms. Nowadays, we hear men like President Conant of Harvard advocate that every Liberal Arts curriculum should include a course in the History and in the Principles of Science; I would like to submit the proposal that the Engineering Curriculum should acquaint the technology students with the history and basic structure and content of music through the ages.—*Klaus Liepmann, Assistant Professor of Music, M. I. T., Journal of Engineering Education, October,* 1950.

BOOK LOOKS

Title: The Deadly Parallel.

Author: George Backer.

Published by: Random House. Price: $3.50.

The title of this timely and well-written piece of non-fiction is taken from the parallel between the patterns of government instituted by Joseph Stalin and Ivan the Terrible. The book is objectively written and the author carefully shows how both rulers "became the state," regardless of the means they chose to secure it. Ethics is subordinated in both philosophies to what they considered to be the future good.

Excellent pictures are drawn of the revolutionary phases of the modern Russian upheaval, and reasons are given for various policy changes instituted by the Politburo which makes them seem not so inconsistent as Western minds would ordinarily think.

Mr. Backer's main point seems to be that life in Russia under the two rulers is not essentially different, except that the extent of Stalin's "kingdom" is much larger and more influential on a world-wide basis.

The work is made a little tiresome in places by the over-citing of Whipper's works, whose writings were largely apologetic for the actions of Ivan IV.

Certainly any insight into Russian thinking is valuable in these times, and if history plus current affairs is your dish, you should enjoy "The Deadly Parallel."

Title: Economic Aspects of Atomic Power.

Authors: Sam H. Schurr & Jacob Marschak.

Published by: Princeton University Press, Princeton, N. J. Price: $6.00.

What will be the economic effects of peacetime application of atomic power? This exploratory study, published for the Cowles Commission for Research in Economics, while not attempting to answer such a speculative question definitely, is the first comprehensive approach to one of the most important and controversial subjects faced by economists today.

For this work, the authors have concentrated on the potential uses of atomic energy that seem the least remote—the generation of electricity from heat caused by nuclear reactors; and transportation of low-temperature heat over short distances, as for residential heating. They present an economic comparison for various areas of the world, between electricity generated from atomic heat and that produced from coal, oil, or water power.

This comparison by countries is followed by an analytical study of the potential applicability of atomic power in several industries which are or may become important consumers of electricity or heat. With this empirical background, the authors present an outline estimate of the economic effects of atomic power—first, on the economy of a highly industrialized country like the United States, and, second, on the industrialization of so-called backward areas.

In dealing with one particular scientific invention, the authors have opened up a methodology for estimating the economic effects of other inventions. This methodology in itself will make the book an indispensable tool for economists, while the detailed industry analyses may prove important not only to economists but especially to executives, public officials and engineers planning for future developments in the industries analyzed.

Title: The U. S. Marines and Amphibious War.

Authors: Jeter A. Isely and Philip A. Crowl.

Published by: Princeton University Press. Price: $7.50.

"The U. S. Marines and Amphibious War: Its Theory and Its Practice in the Pacific," as its title implies, is a story of the Marine Corps' long fight for amphibious warfare as a recognized manner of waging modern war. Unlike official histories, the memoirs of commanders or war reporting, this book, undertaken by the History Department of Princeton University at the request of the Marine Corps, presents a fair and honest picture of this type of strategy and how it was employed in World War II.

Each Marine campaign is fully covered from original plans to a critical recapitulation of actual happenings. Whereas amphibious warfare was never proved a failure, Tarawa was the acid test, and the Corps learned to provide the assault troops in subsequent actions with amphibious tractors to carry them in and establish a beach-head.

The valor of the men who make up the Marine Corps is well illustrated in this excellent history, and the book should stand as a partial tribute to the ordinary men in the camouflaged fatigues who did such extraordinary things.

Title: Science and Common Sense.

Author: James B. Conant.

Published by: Yale University Press. Price: $4.00.

Feeling that science is often misrepresented in the class-room and is not shown in proper relation to the other forces of mankind, Dr. James B. Conant, President of Harvard University, has endeavored to explain science in its relations to other social phases. Although intended primarily for college use, "Science and Common Sense" is written also for the general reader in the hope of affording him "some understanding of the way in which physicists, chemists, biochemists and experimental biologists tackle their problems."

"Science and Common Sense" brings to mind Thomas Huxley's definition of science "organized common sense." However, the criteria of common sense may change from generation to generation. Dr. Conant would seem to agree with Huxley, however, when he says that common sense in science is "a knowledge of the practical behavior of physical objects."

Dr. Conant examines the lives of famous scientists in his work and states that "scientific method" is often erroneously held to be the only method, and that the method may vary from one science to another.

To explain what he names the "tactics and strategy of science" Dr. Conant tells in considerable detail, though simply, how Galileo, Galvani and others made the great discoveries with which their names are linked. Some reference is even made to the basic philosophy of science, as the relation of cause to effect. However, this relation is no longer held by physicists who are convinced that chance rules in the universe.

Although Dr. Conant states that a line can not be drawn between fundamental and applied science, he comes out in favor of the distinction, giving as his reason that the "fundamental scientist" is seeking knowledge for its own sake whereas the "applied scientist" is more interested in utility.

TO THE *Editor* . . .

An E. G. Degree . . .

Dear Editor:

In the many articles and letters that have appeared in the AMERICAN ENGINEER, the authors have consistently likened the profession of engineering to those of medicine, dentistry and law. No attempt has been made to correct this fallacious thesis even though it is the basis of our faulty approach to our mutual problem.

It is necessary rigidly to bear in mind that the physician, the dentist and the lawyer are employed directly by the general public in the vast majority of instances; whereas this is not true in the case of the engineer who is employed by the general public in a relatively small number of cases.

In the former situation the employer is not qualified generally to appraise the qualifications of the professional he proposes to employ and therefore the state rightly exercises its powers to protect the public by a licencing system which assures them that the professional has at least the minimum requirements of training and experience. In the latter situation it would be folly to say that the majority of the employers of engineers are not competent to appraise their qualifications. By the foregoing reasoning it is established that licencing is necessary only for those few cases where the engineer is directly employed by a layman.

The above disposes of the first of the two reasons for licencing of engineers, namely necessity and desirability. The desirability factor derives from an endeavor to enhance the professional standing of the engineer in the social system. No attempt will be made herein to deprecate that commendable endeavor. But for comparison and analysis, let us take a look once more at the epitome of professionalism, the profession of medicine. The college confers the degree of Doctor of Medicine.

The graduate is John Jones, M.D., or Doctor John Jones, anywhere in the world and regardless of how much his colleagues in another state would like to keep him out of competition with them. When a state admits him to practice, it gives him the title of "Physician and Surgeon." In the eyes of the public, it is that M.D. that gives him his professional standing.

The writer suggested several years ago (without stirring up much dust) that the colleges should confer the degree of "Graduate Engineer" instead of the nondescript Bachelor of Science. Then Bill Smith, E.G. would have something he could call his own and which he would not have to share with his "practical" colleagues.

In the event he desired to enter the narrow field of private practice, he could petition the several states to examine him and certify him as a "Consulting Engineer." When we get around to that, and since the Articles of Confederation and the Civil War are both in history, we might suggest that the states would do well to have uniform regulations and to subscribe to the principle of reciprocity.

RAYMOND J. SELWYN, P.E.
Los Angeles, Calif.

The Shortage . . .

Dear Editor:

I would like to endorse the remarks of Hugh H. Carr, P.E., in his letter in your January issue, especially pertaining to the domination of engineering societies by prominent engineers acting as agents of their employers rather than as engineers speaking for their fellow engineers. This tendency may be due to the relatively low prestige which the profession enjoys, so that these men may prefer to be known as employees of famous firms rather than as Professional Engineers in their own names.

It is odd to note, in the same issue of your magazine, attempts both at raising the professional status of engineers and at increasing the number of engineering graduates. It seems obvious that the two pursuits are antithetical. The plight of the profession is that there are far too many engineers for the relatively limited field. There are only about 100,000 physicians for the 150,000,000 people in this country, while there are about 500,000 engineers ministering to about 360,000 corporations. Or, there is one physician per 1500 people, but more than one engineer for every corporation in the nation. The "shortage" of engineers is a patent absurdity. What is usually implied is that there is a shortage of competent professional engineers in the salary range appropriate for draftsmen. *This* shortage should be encouraged until it is impossible to secure engineers at draftsmen's wages.

RICHARD R. PITTS, P.E.
Dallas, Texas.

Dear Editor:

In a recent issue of the AMERICAN ENGINEER I was interested in the piece, "Surplus Or Shortage Of Engineers." As Assistant Chief Examiner for the Minnesota State Department of Civil Service, I have had many contacts with professional engineers in recruiting and selecting young engineers for state activities that require engineering services. . . .

I think that the great numbers who entered engineering training constituted a hitherto untapped pool covering several generations and including a great many who, were it not for the GI Bill, would never have entered the field. I think quality suffered, but I believe most will find a niche in keeping with their abilities. It is evident that we could not expect training to continue at the rate set after War II, but my point is that it was not an unusual spurt in enrollment; rather, it was the pent-up impulse toward engineering training that covered four or more years, and included many for whom opportunity knocked when the government undertook to pay the bills.

Further, there are undoubtedly certain overlooked factors such as number of births by year, back in the twenties and thirties, which produced individuals ready for training. We are inclined to ignore population trends by age-groups, and to think inclusively in terms of increases in total population. In short, how many boys were born in 1924, 25, 26, 27 and 28 as compared to ten years before and ten years after. Perhaps there were fewer who were of an age to embark upon any kind of professional training in 1946 than we would expect. Or were there more?

Another question: is the Attrition Rate higher or lower than we might ordinarily expect: 93,000 entering freshmen in 1946, 51,000 seniors, 47,000 engineers graduated in 1950. Seems like an unusually high rate of mortality among trainees—I don't know; I have never investigated the matter before. Have you?

Further: is it wise to employ trained engineers in "marginal" jobs only indirectly related to the field. Is it proper to "waste" such training in jobs in which it is not really needed? Perhaps the Bureau of Labor Statistics figure of 17-18,000 per year for actual engineering jobs is correct. Perhaps these marginal jobs are absorbing marginal engineers, men who would never really make a contribution in "real" engineering anyhow. What factors created 35,000 actual placements in positions presumably making use of engineering training in 1949. Is this merely an indication of pent-up demand and deferred work? Is it accurate to project this rate into the future? I am deliberately suggesting that trained engineers tend to be wasted in jobs that might be done by others of lesser training.

The volatility of engineering employment opportunities must be extremely upsetting to the profession. This is a sign that too many apprentices are still getting into the field. How can you be *professional* until you can control the number entering your field and keep it *lower* than the number necessary for national well-being? You can all see for yourselves the best managed profession in this regard, and I am too well aware of the other vested interests that are aggrandizing themselves by similar tactics in many other erstwhile professions which get that way by raising requirements higher and higher to keep out more and more people. Your way is clear. You can't be truly professional until there aren't enough of you to go around. *Then* you'll have it.

MARVIN W. STRATE,
St. Paul, Minn.

Fund Drive . . .

Dear Editor:

Your "Missouri Leads in Fund Drive" (Public Relations Fund Drive) in February issue observed with interest. I note that of the first seventeen states Maryland is the lone representative of the East, if Maryland is really of the East. I also note —ho-hum!—that Arkansas (23) is ranked between New York and Illinois, 22 and 24 respectively, and that Pennsylvania is an absolute last, maybe with a pulled tendon or maybe getting ready for a great stretch run and, to carry out the simile, it might be that New York and Illinois are deliberately pocketing Arkansas.

Some of these placements are just a little puzzling, relatively of course, but sometimes it is just a little puzzling too, where, in kicking the cover off of dormant ground, one finds the better sprouts.

L. R. PARMELEE, P.E.
Helena, Ark.

Around The Nation With Our Members

Waddleton Speaks To Southern Nevada Group on Jet Propulsion

Colonel Thomas R. Waddleton, Commanding Officer of the Research and Development Fighter Gunnery Squadron, Nellis Air Force Base, Las Vegas, Nevada, was the guest speaker of the Southern Nevada Chapter, NSPE, at its regular monthly meeting at the Trophy Room of the Last Frontier Hotel on February 2.

Colonel Waddleton's address covered the elements of jet plane power plants. He stated that the principle of jet propulsion originated in China around 600 B. C. and that this type of propulsion had reached its highest development in Germany during World War II.

Colonel Waddleton indicated that the development of jet propulsion by other countries is equal or superior to our own, but the American pilots, due to their special training and experience have been able to hold their own in the air. The Colonel warned that jet propulsion is still in its infancy, and that if our nation expects to compete with other nations in the struggle for supremacy it must spend millions for further development.

McKinnon Speaks To Metropolitan Chapter Of Massachusetts SPE

The mid-winter meeting of the Metropolitan Chapter of the Massachusetts Society met on February 6 at the University Club in Boston. The featured speaker of the evening was Mr. J. Gordon McKinnon, Director of Sales Training, Burdett College.

Mr. McKinnon illustrated the essential features of successful salesmanship and explained how they apply with equal importance to the profession of engineering. Entertainment was provided by the Providence Neptunists, one of New England's famous Barber Shop Groups.

Wednesday, April 4, was announced as the date of the next meeting with Mr. Bradford Washburn, Director, Boston Museum of Science, as guest speaker.

Takes New Office

Alfred D. Yanda, P.E.

Yanda Is Elected President Cleveland Section, ASME, For 1951

Mr. Alfred D. Yanda, Cleveland Chapter, Ohio Society, has been elected President of the Cleveland Section, American Society of Civil Engineers for 1951.

Yanda received his education at Ohio State University and began his career by assisting in the design and construction of the Vero Beach-Tampa Highway in Florida.

In 1945 he was appointed Division Planning Engineer for the State of Ohio and subsequently was employed by the Cleveland Transit System and the Central Viaduct-Inner Belt Freeway Planning Office in Cleveland.

Yanda is well known for his work in highway engineering and has recently joined the Verne M. Clarke Engineering Company as a partner.

Noted Feminine Writer Addresses New York Chapter

The New York Chapter of the NYSSPE heard Mrs. Ruth Hooper Larison, author of the recent book *How to Get and Hold the Job You Want*, at its recent meeting on February 8 at the Statler Hotel in New York.

District of Columbia Society Hears Talks On Registration Bill

The District of Columbia Society met on February 5 at the Potomac Electric Power Company auditorium in Washington, D. C. The topic under discussion was Public Law 789, an act defining and regulating the practice of the profession of engineering and creating a Board of Registration of Professional Engineers in the District.

Two members of the Board, Mr. Daniel C. Walser, Chairman, and Mr. Leo H. Cleary, Secretary-Treasurer, participated in the forum and Colonel Walter L. Simpson, Chairman of the Legislation Committee, D. C. Council of Engineering and Architectural Societies, was the third speaker. The law was fully explained in the short talks and a question and answer period followed.

The public was invited and more than 300 interested engineers attended.

Roush Heads Drive For Greater Kansas City Heart Association

Mr. C. G. Roush, NSPE Vice-President for the North Central Area, was chairman of the recent fund drive for the Greater Kansas City Heart Association. The campaign began on February 1 and continued throughout the month.

Limited appeals were made to about 200 persons known to have a vital interest in the cause. In connection with this decision, Roush wrote a letter to Joseph C. Williams, president of the Kansas City Chamber of Commerce, expressing agreement with "objective efforts . . . on multiple fund campaigns."

The committee hoped to raise $30,000 by the limited appeal, and Roush said that no public campaign was conducted, except that heart-shaped plastic containers were distributed in the downtown and outlying business districts for coin gifts.

Mr. Roush is Chairman of NSPE's Public Relations Committee and has long been known for his interest in civic works.

Noted Speakers Highlight Texas Annual Meeting

The Texas Society held its Fifteenth Annual Meeting in Mineral Wells at the Baker Hotel on January 25, 26 and 27. Highlights of the meeting included an address of welcome by Major George Barber of Mineral Wells and speeches by NSPE President S. L. Stolte; Dean W. R. Woolrich, Engineering Department, University of Texas; Mr. John Ben Shepperd, Secretary of State for Texas, and Mr. Dan J. Martin of the Hughes Tool Company.

In the keynote address by Sidney L. Stolte, it was pointed out that the National Society is now attempting to facilitate reciprocity between the various states. Mr. Stolte stated that there are reportedly 400,000 qualified registrants with only 150,000 actually registered as Professional Engineers, of which 24,000 are members of NSPE. Stolte said further that NSPE is attempting to see that the engineers are properly distributed among the three fronts; namely, (1) the "hot" or armed front; (2) the production front; (3) the home, or civilian defense front. Engineers are particularly qualified for civilian defense because they know about water and sewer systems, public utilities, safety of buildings and structures, and operations of machines, Stolte continued.

Dean Woolrich of the University of Texas Engineering School, in his discussion of "The Education of Engineers for National Security," pointed out that on a long-term basis we must concern ourselves with the educational system in the secondary school and high school levels. Up to a bachelor's degree, the Dean stated, we are behind Europe, especially the Scandinavian countries, in fundamental education. A revival is needed of primary and secondary education in history, language, government, mathematics, etc. On an immediate basis, there will develop a critical shortage of engineers in the next few years; therefore, engineering manpower in industry must be conserved and more new men must be trained. Woolrich said although normal requirements are for 30,000 engineers per year, it was estimated that there will be only 12,000 engineering graduates in 1954.

Other addresses were by Mr. John Ben Shepperd, Secretary of State for Texas, on "The Responsibility of the Professional Engineer as a Citizen," "The Conservation of our Natural Resources for National Security" by Mr. William J. Murray, Chairman of the Texas Railroad Commission, and an informative address by Mr. Daniel J. Martin, Vice-President of Hughes Tool Company on "The Responsibility of the Professional Engineer in a War Mobilized Industry."

Dr. Martin pointed out that managements should utilize their engineers to the fullest extent, even though it appears that they might soon be called back into military service. He stated there will be virtually no replacements, and also cautioned the older engineers to take care of themselves for the bigger job that they will be called upon to do.

The Ladies' Program included a luncheon at Seybolds Guest Ranch, an informal dinner and dance on the Roof Garden of the Baker Hotel, and a Buffet Style Brunch in the Orchid Room of the Baker Hotel.

NYSSPE AUXILIARY COMMITTEE

The above picture was taken at a recent meeting of the Ladies Committee for the Silver Anniversary Convention of the New York State Society which was held at the Hotel Statler in New York. Reading left to right, seated: Mrs. Ernest F. Fox, Mrs. John E. Lane, Mrs. Paul Kepper, Mrs. Meyer Tannebaum. Standing: Mrs. Lucien J. Cavegnet, Mrs. Charles A. Hescheles, Mrs. Clifford W. Valentine, Mrs. Fred J. Biele, Mrs. E. P. Neuschwander, Mrs. Leslie Wax.

Oklahoma Society Hears Governor At Annual Meet

The Oklahoma Society held its 16th Annual Meeting at the Hotel Biltmore in Oklahoma City on January 12 and 13. Business meetings, a panel discussion and special group meetings were among the activities of the group, and the Meeting was concluded with the Annual Dinner and Dance which was high-lighted by the address of the Honorable Johnston Murray, Governor of Oklahoma.

Missouri's Board Of Directors Meet At Jefferson City

The Board of Directors of the Missouri Society met in Jefferson City on January 13 and 14. At the opening session, President Dean Wilson of Hannibal sounded the keynote for the activities of the Society for the current year.

Other officers for 1951 are as follows: C. M. Lytle, First Vice-President; J. W. Hubler, Second Vice-President; Harold J. Bruegging, Treasurer.

President Wilson emphasized that the Society's activities must be important enough to the engineering profession to attract and retain the necessary number of professional engineers.

Chattanooga Chapter Of Tennessee SPE Holds Officers' Installation

The 1951 Chapter officials of the Chattanooga Chapter, Tennessee Society, were installed at a Buffet Supper and Square Dance held at the Chattanooga Rod & Gun Club on January 27.

The new officers include: O. S. C. Hammer, President; W. D. Smith, First Vice-President; E. F. Pohl, Second Vice-President; J. P. Bouquard, Treasurer; M. E. Boriss, State Representative; and Alan M. Razovsky, Secretary.

THE MEETING THAT MADE MILWAUKEE FAMOUS . . .

The above scenes were taken at the recent Eighth Annual Convention of the Wisconsin Society in Milwaukee. Reading left to right, on the left: A. G. Behling, National Director; W. A. Piper, Secretary, Wisconsin Registration Board of Architects and Engineers, (speaker); E. J. Kallevang, President; and F. T. Agthe, President Elect. On the right are the newly-elected officers of WSPE: Pierce J. Ellis, 2nd Vice President; F. T. Agthe, President, (seated); R. C. Clark, 1st Vice President; W. G. Youngquist, Secretary; and L. M. Schindler, Treasurer.

Wisconsin Society Meets for Eighth Annual Convention

The Eighth Annual Convention of the Wisconsin Society was held on January 25, 26 and 27 at the Pfister Hotel in Milwaukee, Wisconsin. Among the activities of the Society were three series of functional group meetings, a panel discussion on "How Industry Trains Engineering Personnel" and the Annual Dinner with Dr. Frank C. Hockema, Vice President and Executive Dean, Purdue University, as guest speaker.

Dr. Hockema's topic was "Educating Engineers for Tomorrow's World" and his address was arranged through the courtesy of the Public Relations Department of the General Motors Corporation.

Dean William D. Bliss, Engineering School, Marquette University, was the moderator at the panel discussion on "How Industry Trains Engineering Personnel," and members of both industry and education participated.

Mr. W. A. Piper, Secretary of the Wisconsin Registration Board of Architects and Professional Engineers, was the speaker at the luncheon on February 27 which concluded the meeting. Mr. Piper's topic was "Examination for Certification and Registration."

The ladies' program included an informal tea, luncheon, cards, and the Annual Dinner.

ILLINOIS HOLDS 66th ANNUAL MEETING

The above pictures are scenes taken at the recent 66th Annual Meeting of the Illinois Society, held recently at Champaign-Urbana. Reading from left to right, on the left: S. L. Stolte, President, NSPE; J. J. Woltman, New Honorary Member; G. E. Ekblaw; H. E. Babbitt. On the right: J. H. Morgan, Past President, NSPE; F. A. Reickert; W. C. Huntington.

Illinois Society Convenes for 66th Annual Meeting

The 66th Annual Meeting of the Illinois Society was held at Champaign-Urbana on February 1, 2 and 3. The majority of meetings were held in the North Illini Union Building, while the Urbana Lincoln Hotel was the scene of other activities.

The convention opened with a Board of Directors meeting on February 1, and the day was concluded with a social gathering in the Garden Room of the Urbana Lincoln Hotel in Urbana, the Champaign County Chapter, ISPE, serving as hosts.

Among the activities of the next day were two inspection trips, a motion picture and the Annual Business Meeting. Mr. Sidney L. Stolte, NSPE President, spoke at the luncheon and the day was concluded with the 66th Annual Banquet. Major Lennox R. Lohr, Director, Museum of Science and Industry, Chicago, and State Director of Civil Defense, was the principal speaker, and his topic was "The Engineers' Role in Civil Defense."

On February 3, the group saw another motion picture, the Business Meeting was concluded and the Annual Meeting was adjourned at 12 o'clock.

Special plans for the ladies included a coffee hour, luncheon and the Annual Banquet on February 2.

DELAWARE SOCIETY RECEIVES CHARTER

Photographs shown above were taken at the recent meeting of the Delaware Society at which a charter presentation was made by President Sidney L. Stolte on behalf of NSPE. Reading left to right, top left: J. L. Bahr, President, DSPE, is shown shaking hands with S. L. Stolte, President, NSPE, as Leo Blumberg, Chairman, Board of Registration, stands by in the background. Top right: The Honorable Elbert N. Carvel, Governor of Delaware, is shown addressing the group. Bottom left; standing: Russell B. Allen, National Treasurer; William E. Torperzer, President, Philadelphia Chapter, PSPE; John T. West, Jr., Exec. Sec., PSPE; Colonel M. J. Blew; James Howard, San Jacinto Chapter, TSPE; Paul H. Robbins, Executive Director, NSPE; Seated: Gordon Bodien, President, Minnesota Society; John L. Bahr, President, Delaware Society; S. L. Stolte, President, NSPE; Louis Klauder, President, New Jersey Society; and Arthur M. Gompf, President, Maryland Society. Bottom right: Delaware Society and guests at dinner.

Delaware Society Receives Charter At Recent Meeting

The Delaware Society was presented with its charter from NSPE on January 11 at the Hotel Rodney in Wilmington, Delaware. At the same meeting, state and civic officials pledged all possible assistance to the group in carrying out its program.

Attending the ceremony were the Honorable Elbert N. Carvel, Governor of Delaware, Wilmington City Treasurer, Alexander R. Abrahams, Mr. William Freegard, president of the Delaware Chamber of Commerce and engineers from states as far distant as Texas. Mr. Abrahams represented Mayor James F. Hearn of Wilmington who was ill at the time.

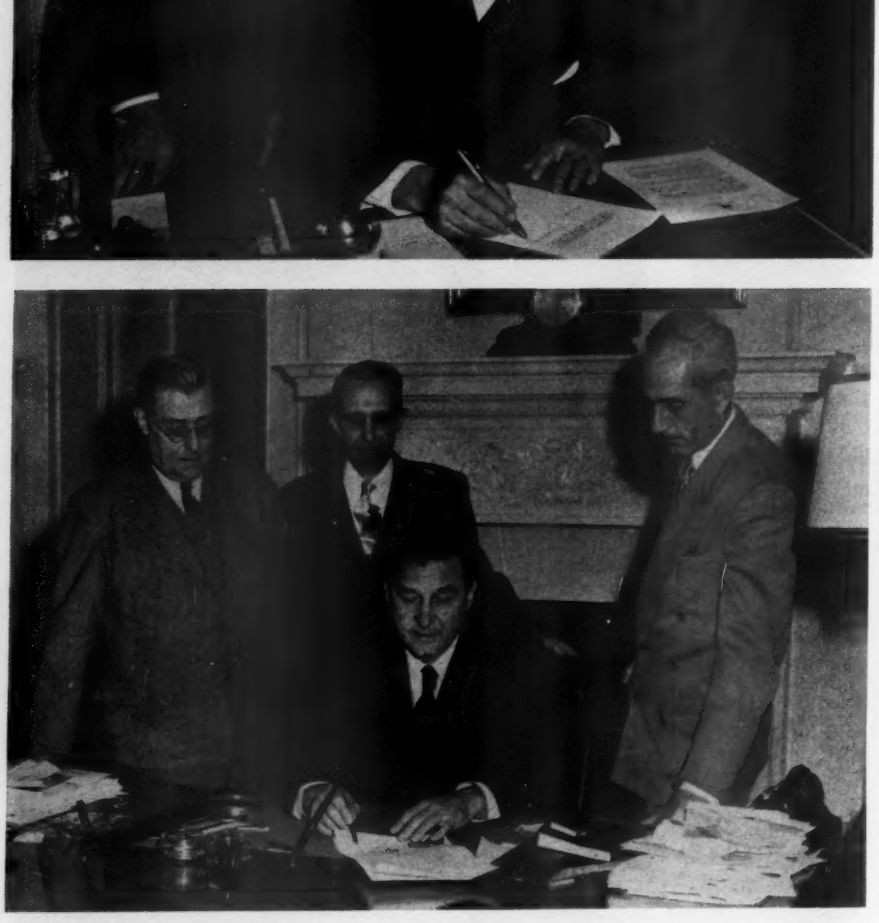
In congratulating the group Governor Carvel said, "The State of Delaware has made great strides because of the well trained and forward-looking engineers we have." The Governor said further that the banding together of the engineering profession will result in exchange of ideas and he called this one of the most gratifying things about the Society.

Mr. Abrahams said, "Your Society is going to mean a lot to us in these troubled times," and continued, "You will play a very important part in the building up of Wilmington."

Presentation of the charter and the principal address were made by NSPE President S. L. Stolte. Mr. Stolte called the formation of the Society part of the awakening of the professional conscience of the engineering profession. Stolte disclosed that the presentation of the new charter was the first such occasion he had experienced since becoming President of the National Society.

Among the guests introduced at the meeting were: Thomas H. Chilton, President of the American Institute of Chemical Engineers; Louis Klauder, President of the New Jersey Society; John T. West, Executive Secretary of the Pennsylvania Society; Herbert Russell, President of the Delaware Chapter of the Pennsylvania Society; William Toperzer, President of the Philadelphia Chapter, PSPE; James Howard, Past President of the San Jacinto Chapter of the Texas Society; Colonel Michael Blew; Gordon Bodien, President of the Minnesota Society; Russell B. Allen, Treasurer of NSPE and NSPE Executive Director Paul H. Robbins.

OHIO AND N. Y. GOVERNORS PROCLAIM WEEK



Shown above are two State Governors as they signed Engineers' Week proclamations. In the top photo, the Honorable Thomas E. Dewey, Governor of New York, is shown signing the statement for New York as Robert A. Sovik, P.E., President of the New York State Society, (left) and Mr. John B. Walsh, P.E., author of extensive works on the early engineering endeavors of George Washington, look on. In the bottom photo, the Honorable Frank J. Lausche, Governor of Ohio, signs the proclamation. Others in the picture (left to right): Harry E. Nold, former President of NSPE; Lloyd A. Chacey, Executive Secretary, OSPE, and George Clark, President, OSPE.

TO ALL STATES AND CHAPTERS . . .

NSPE's first effort to promote a nationally observed Engineers' Week has met with resounding success. According to early reports, State and Chapter organizations throughout the Nation used many devices to call the public's attention to the great engineering profession. Deadlines prevented a full report in this issue but in the April publication we hope to publish a complete "round-up" of stories from all States and Chapters. SEND US YOUR STORY AND PICTURES NOW. Make certain that your efforts are reported upon in the next issue of the American Engineer.

—The Editors

Dewey Signs New York State Proclamation For Engineers' Week

Governor Thomas E. Dewey of New York signed a statement from the Executive Chamber in Albany on February 5 proclaiming Engineers' Week in the State of New York in which he said, "America is today without equal in the family of nations. Its people enjoy a higher standard of living than will be found elsewhere in the world . . . Much of this greatness is a testament to the professional engineers of our nation."

The statement continued, "The government of New York State has taken the initiative in planning for whatever defense measures will be necessary to protect its people. But before the shadow of the red cloud has passed by, it may be necessary for us to build bomb shelters and other protective devices. Should the time come when any attack by the enemy might penetrate our military defenses, we will be confronted with the task of restoration and maintenance of essential facilities which may have been damaged or destroyed."

"All this will be the task of the professional engineer. They are the men whose genius will give us the ability to remain free—to remain great," Dewey said.

Elsewhere in the state, Engineers' Week was celebrated by radio programs and spot announcements, product and model displays by large industries, news stories and releases, and a question and answer television show from Syracuse on which Mr. Robert A. Sovik, President, NYSSPE, answered questions on the various phases of work done by the Professional Engineer.

Varied Activities Featured By Arizona For "Week" Observance

The Arizona Society arranged a program of displays and radio shows for its participation in the observance of Engineers' Week. Featured especially throughout the week were the prominent display of the Governor's proclamation in shop windows throughout Phoenix and Tucson, window displays by the local utilities featuring some large and familiar engineering projects, mention of the Professional Engineer by the sponsors of several standard local radio programs, and the featuring of the Professional Engineer in special newspaper ads sponsored by prominent groups of companies whose normal activities are predicated directly upon engineering.

Missouri Chapters Have Active Program For Engineers' Week

The Engineers' Week Committee of the Missouri Society, under the chairmanship of Mr. Yale Witschner, conducted an extensive celebration of the Week throughout its eleven Chapters.

Specific plans for the Western Chapter included talks by professional engineers to various service and civic clubs in the Kansas City area, a proclamation of National Engineers' Week by Mayor Kemp of Kansas City, a series of spot announcements to 40,000 persons who ride the public buses daily in Kansas City, and news releases to local and national press wire services.

The Jefferson City Chapter sponsored an organizational dinner meeting on February 24 at the Daniel Boone Hotel in Columbia for the purpose of forming a new Chapter in the six-county area immediately north of the Missouri River. The special program prepared by committees of the Jefferson City Chapter included presentation of a charter, an inscribed hand-made gavel, a new record book and an initial fund for Chapter expenses. In addition, the Chapter awarded a professional achievement certificate to Mr. Carl W. Brown, P.E., at a special noon luncheon on February 20 at Jefferson City.

The Ozark Chapter furnished speakers for several service clubs in Springfield throughout the week and at least two fifteen minute radio shows were sponsored by the Chapter with members participating. Springfield's Mayor proclaimed National Engineers' Week and news releases were furnished to local papers.

The Southwest Chapter had speakers engaged for several civic and service club meetings in the cities of Joplin, Carthage, Neosho, Aurora, Nevada and Lamar. The Empire Electric District Company cooperated in the matter of posters and window displays, and plans called for members to make brief radio talks and for feature stories to be distributed to newspapers of the larger towns in the area.

The Rolla Chapter presented talks to three civic clubs and to the Chamber of Commerce at Rolla. The Missouri School of Mines held a special convocation with a prominent out-of-town engineer as guest speaker. Four members of the student chapter of the Society at the School of Mines presented a fifteen minute radio broadcast over the local station, pointing up the importance of Rolla as an engineering center, unusual facts about the School of Mines, the U. S. Geological Survey mapping services and other services by the Bureau of Mines and the State Geological Service.

A special Committee of the St. Louis Chapter established a roster of professional engineers to speak to a dozen or more civic and service clubs in the metropolitan area. Major engineering projects throughout the state were the subject of newspaper and radio stories throughout the week.

The Northeast Chapter celebrated the Week with a dinner and dance at the Hotel Mark Twain in Hannibal on February 23. In addition, a member of the Society from out-of-town addressed a joint meeting of the Kiwanis and Lions Club during the Week. News releases and brief radio comments were prepared as additional publicity.

The Northwest Chapter had a dinner meeting during the Week with a special program and invited guests. The local radio station gave brief comments on the role of the professional engineer in the area.

Copies of newspaper stories, radio programs and other material used in the observance of Engineers' Week will be collected throughout the State for future information. As a result of the Week's activities, the Society hopes that the public will have a better understanding of engineering as a profession and that professional engineers will be stimulated to acceptance of increased political, civic and social responsibilities.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS FOUNDED 1934

President, SIDNEY L. STOLTE, P.E.
Battenburg, Townsend and Stolte
1437 Marshall Ave.
St. Paul 4, Minnesota

Vice-President, L. L. DRESSER, P.E.
President, Dresser Engineering Co.
P. O. Box 2518
Tulsa 1, Oklahoma

Vice-President, CHERRY L. EMERSON, P.E.
Vice President,
Georgia Institute of Technology
Atlanta, Ga.

Vice-President, JOHN D. COLEMAN, P.E.
Supervisor, Material Utilization
Work Manager's Staff
Frigidaire Division
General Motors Corporation
2520 Elsmere Street
Dayton, Ohio

Vice-President, C. G. ROUSH, P.E.
Manager, Westinghouse Electric Corp.
101 W. 11th St.
Kansas City, Missouri

Vice-President, GEORGE J. NICASTRO, P.E.
Combustion Engineering—Superheater, Inc.
200 Madison Avenue,
New York, N. Y.

Vice-President, EARL N. HOLM, P.E.
Valuation Engineer, Sacramento Municipal Utility District
1320 N. Street, Apt. 102
Sacramento, California

Treasurer, RUSSELL B. ALLEN, P.E.
Professor, Civil Engineering, University of Maryland
4610 Hartwick Road
College Park, Md.

Executive Offices
1121 Fifteenth Street, N.W.
Washington, 5, D. C.

Executive Director, PAUL H. ROBBINS, P.E.

KENNEDY-RIEGGER DRILLING CO., Inc.
Diamond Drill & Core Borings
TEST BORINGS
5418 Post Road — New York City
Telephone KI 9-8458

AEROFIN
CORPORATION
Syracuse — New York

THE WIESNER-RAPP Co., Inc.
Machinery Builders
1600 SENECA ST., BUFFALO 10, N. Y.

When Writing Advertisers, Mention
THE AMERICAN ENGINEER

New York County Chapter Sponsors Courses At Cornell

Cornell University has announced three engineering courses for the New York County Chapter of the NYSSPE. These courses are open to all engineers in the metropolitan area.

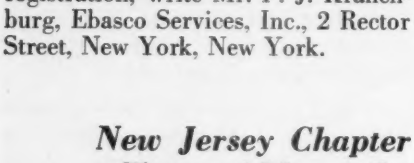
The three courses include: "The Engineer's Problem in Human Relations," "The Engineer's Role in Management-Employee Relations," and "Conference Planning and Effective Oral Presentation for Engineers."

Classes are limited in size and applications will be accepted in the order received. The fee for each course will be $4.00 to offset Society expenses. For further information concerning registration, write Mr. P. J. Kranenburg, Ebasco Services, Inc., 2 Rector Street, New York, New York.

New Jersey Chapter Hears Address On Civilian Defense

The Monmouth-Ocean Chapter of the New Jersey Society held a dinner meeting at the American Hotel in Freehold, New Jersey recently. The guest speaker for the evening was Dr. Samuel Loveman, New Jersey Civil Defense Commander of the Coastal Area.

Dr. Loveman gave details of the Area Organization and the part which the engineer will play in Civil Defense.



WELDING CONNECTORS

Saxe System Welded Connection Units for welded assembly

Saxe Units place in position and securely hold together structural parts to be welded.

As used in many welded structures they *eliminate all hole punching*, producing an economical, rigid, safe and quickly erected structural frame.

Write for 58 pg. Manual containing full engineering design information for welded structures.

J. H. WILLIAMS & COMPANY
Buffalo 7, New York

Canadian Representatives
G. D. PETERS CO., Montreal 2, Canada

Steinman Poem...

Dr. D. B. Steinman, eminent bridge-builder and first President of NSPE, is known not only for his engineering works, but for his literary efforts as well. In addition to his prose work, "The Builders of the Bridge," Dr. Steinman has written many poems. "The Bridgebuilders" is his latest work.

THE BRIDGEBUILDERS
by D. B. Steinman

Three youths, with high ambition filled,
Besought a master, nobly skilled,
To train them in the builder's art.
He strove to reach each mind and heart;
And then, as touchstone of his plan,
Assigned each youth to build a span.

The first apprentice worked with speed
And proudly finished in the lead.
But soon his hopes of praise were dashed:
His bridge was weak and quickly crashed.
He feared the master's glance to face
And fled the land in sad disgrace.

The next apprentice built a span
Devoid of beauty in its plan.
The lines were crude, the form was mean—
A discord in the peaceful scene.
Yet, though reproached, the youth held fast:
"Suffice it that the bridge will last!"

The master spoke: "You have no right
To perpetrate a lasting blight.
Whoever builds an ugly span
Is faithless to both God and man.
No one deserves the trust to build
Unless the artist's passion filled."

The third disciple wrought his dream
And built a symphony supreme.
The best in heart and brain of man
Took form in this inspiring span—
A bridge uniting strength and grace,
A gift of beauty to the race.

Then spoke the master: "Nobly wrought!
You caught the dream the world has sought.
In beauty glows the spark divine
To carry forward God's design.
Your work will lift the hearts of man,
And all will bless you for your span."

Los Angeles Chapter Hears Elieson On Production Authority

The Los Angeles Chapter of the California Society met on January 9 in the Institute of Aero Sciences Building, Los Angeles, to hear an address by Mr. Walter E. Elieson, Deputy Regional Director of the Los Angeles office of the U. S. Department of Commerce. Mr. Elieson's topic was "National Production Authority Rules & Regulations."

UNITED STATES TESTING COMPANY, Incorporated

Offers a comprehensive professional service in sampling, engineering inspection and testing, microscopy, chemical and bacteriological analysis, physio-chemical, acoustical, thermal and electrical measurements, product and process investigation and development, research, and consulting.

1415 PARK AVENUE **HOBOKEN, NEW JERSEY**

Simpson Of Connecticut Society Elected To ASHVE Life Membership

Mr. William K. Simpson, P. E., member of the Connecticut Society, is one of the seven engineers who have been elected to life membrship in the American Society of Heating and Ventilating Engineers.

Secretary of the Connecticut Board of Registration for Professional Engineers and Land Surveyors, Mr. Simpson was born in New Haven, Connecticut and attended Sheffield Scientific School and Yale University, where he received the degree of Ph. B. in 1905 and M. E. in 1907.

From 1907 until 1908 he was assistant master mechanic at the Chicago refinery of Corn Products Company and was associated with the Nason Manufacturing Company, New York, as a mechanical engineer and general superintendent from 1908-1919. He joined the staff of Hoffman Specialty Company, Waterbury, Connecticut, in 1919, first becoming secretary and then vice president and director. Between 1928 and 1942, Mr. Simpson was also proprietor of R. H. Brown & Company, vice president and director of Motors, Incorporated, and president of the Berkshire Company.

Graf of Illinois Society Elected To Council Presidency

Mr. Alois W. Graf, Chicago patent lawyer and member of the Illinois Society, has been named President of the Illinois Engineering Council for 1951.

The Illinois Engineering Council is composed of sixteen engineering societies and is active in civic and governmental matters pertaining to the engineers' professional interests.

Philadelphia Group Holds President's Night Festivity

The Philadelphia Chapter of the Pennsylvania Society held its 1951 Model President's Night on January 20 at the Engineers' Club of Philadelphia.

Dinner was served at 7, and dancing followed for the remainder of the evening. Souvenirs were provided for the ladies and Joe Farina's orchestra provided dance music in addition to a number of entertaining vaudeville acts.

Birds

(*Continued from page* 11)

these committees we would surely find a parallelism of thought and action. We would find a desire to maintain a high educational level in our schools; a continuous study of legislative matters looking out for the possibility of improving and strengthening the registration act, and of supporting other legislation protecting the public; a program devoted to keeping the public educated on our respective professions; and a continuous campaign guarding against unethical practice of our members. Here indeed is a criterion indicating what should be our common purpose, that of constantly developing ethical and professional consciousness.

It seems self evident when, in the light of these past comments, that we have answered the unstated query which is the title of this piece. It is well then to examine whether we can rely on the postulate that we should flock together.

One immediately apparent benefit of closer unity would be an improvement in the esteem of government and public for the professions. There is no denying that there is dirty linen to be washed in both professions, and I would be hypocritical if I said the fault is all on the part of Engineers. There are minor infractions among members of both groups, but it is most important that disagreement be settled "among us girls" so to speak. Is we wash our dirty linen in public both professions will go down in the esteem of the public. If on the other hand the public sees these professions working together for the common good and exposing a common front which has previously been settled amicably by studied cooperation they cannot help but develop a high esteem for Engineers and Architects alike.

SUCH a unified public relations program will help give the public an undertsanding of the inter-related roles of Architects and Engineers, and will lead to the elimination of confusion on the part of the layman as to the consultant needed for a specific job. It should stimulate greater confidence on the part of the client toward the professional competence of Engineer and Architect and hence lead to developing in us a resolve to merit such confidence. One way in which this can be brought about will be by a growing dependence by each of us on the specialized training and experience of the other. The Engineer called upon to design a structure will lean upon the counsel of an Architect in all matters in which the latter is a specialist, and the Architect who is retained on a building will consult with an Engineer on all phases of the project calling for Engineering design. This interdependence which would seem so obvious has often been neglected, the result of which has been not so much a loss to the other profession which was not consulted, as an injury to the public at large and the client footing the bill. Continued cooperation and interdependence will without doubt improve the esteem in which the public will hold us.

There should be desirable professional results to be obtained by closer relationship between the two Societies.

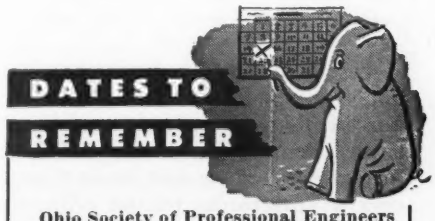
As previously shown, a growing respect in each other will lead the way to more and more reciprocal consultation, which will not only be of benefit to the public, but will also be of direct benefit to each of the professions. It will bring about freer interchange of ideas and techniques which will give us greater versatility. New developments, processes and materials will more quickly be disseminated to the rank and file of each profession. More cooperation is needed for the two societies to have a schedule of fees which even now is essentially in conformity. Such conformity, coupled with compliance with an adequate code of ethics will do much to eliminate unfair competition for services and will eventually be reflected in a better financial position for our members.

More important still will be our improved professional attitude, and a clarification of our position of trust. We will embark with greater confidence in a program of intelligent and uniform enforcement, not only of those legally unqualified to practice but also of our own members engaging in unfair competition, fee cutting and other malpractice. The time may come when each Society will feel free to refer to the other for study and appropriate action cases allegedly encroaching on its members. Before such a time arrives it will obviously be necessary to explore and define the boundaries of overlapping activity. This twilight zone will have to be studied with calmness and prudence, for it is in this difficult region that misunderstanding will be engendered. And until such time as we can look philosophically at such activity, moderation will have to be practiced.

This year can well mark the beginning of a new era in Architect-Engineer relationships. It seems logical that we must accept the fact that we are birds of a feather. It seems evident that it is to our common good that we should flock together. In order that we may realize the greatest good out of this new union it is imperative that we cooperate closely, and true cooperation will require a meeting of the minds.

Cooperation at the State and National level does not guarantee solidarity at the local level. We must implement this concept of unity by a program aimed at stimulating cooperation and unified thinking at chapter levels. Though the chapter boundaries and the two societies are not homologous we might well institute combined chapter meetings. Attendance at such meetings would soon dispel any motions that we are at cross purposes with one another. We would soon discover that our grievances are more quixotic than real, and that rather than expend our energies charging at the vanes of windmills we devote our concerted effort along the lines that will strengthen us professionally.

I HAVE worked at spreading the gospel of unity among the branches of engineering, for we are indeed a far-flung, heterogeneous group. Our overlapping boundaries are many and no more ephemeral than the boundary between Engineers and Architects. We cannot afford to be departmentalized and we strive to achieve through our professional society a sane philosophy. Though we are registered as Civil, Mechanical, Electrical and several other categories of Engineering, some States have seen fit to empower us to engage in the practice of Engineering without qualification. Our professional conscience must dictate our competency or incompetency to undertake a given assignment. When asked to perform an engineering service in the field of Civil Engineering for which I do not feel qualified by reason of lack of specialization or experience, not only must my sense of the ethical prevent my undertaking it, but were I fool enough to struggle



Ohio Society of Professional Engineers —Annual Meeting, March 29, 30 and 31. Toledo.

New Jersey Society of Professional Engineers—27th Annual Convention and Exposition, April 6 and 7. Haddon Hall, Atlantic City.

New York State Society of Professional Engineers — Silver Anniversary Convention and Annual Engineering Industries Exposition, May 10, 11 and 12. Statler Hotel, New York City.

Pennsylvania Society of Professional Engineers — 16th Annual Convention, May 18 and 19. Allentown.

National Society of Professional Engineers—Annual Meeting, June 13, 14, 15 and 16. Hotel Nicollet, Minneapolis, Minnesota.

through it with the help of appropriate handbooks the time would come when my professional reputation would suffer. If, on the other hand, I had arrived by independent study and practical experience at competency in a field of refrigeration, let us say, to the point of being capable of rendering adequate profession service in that field then I should not hesitate to accept such a consultation offer. Registration Acts and Boards were not enacted and set up for Engineers. They were established for the protection of the public against malpractice. We who practice by virtue of the privilege legally vested in us owe an obligation to the public which is in reality our government, namely to see to it that professional competency, proven by performance, is the true criterion of a man's right to practice Engineering.

I wonder if the same professional thinking should not govern architects and engineers. I wonder if we are not indeed true birds of a feather, one professional group. I wonder, indeed, if those states having one Registration Board for Engineers and Architects have not arrived more closely at the real answer to our professional status.

At this moment I see vistas of great promise. I have seen overtures made and accepted leading toward a greater understanding of the common problems of Architects and Engineers. I have seen representatives of the two professions meet together and treat with calm appraisal areas of potential friction between the groups. I have seen an attitude on the part of leaders of both professions that augurs well for future solidarity.

I foresee an era when Architects and Engineers throughout the land pursue their interlacing tasks, shoulder to shoulder, whether in cooperation or competition, with a clear-cut concept of mutual esteem and interdependence.

The Engineer-Power Problem

(*Continued from page* 15)

In any future conflict the differences may be even less than they were during the last war. Civilians in the United States, particularly those located in industrial areas, have slight chance of being spared the terror which has been experienced only by those on combat duty in the past. Sacrifices of varying degree will be made by both military and civilian personnel.

The third fallacy assumes that engineer-power for research, design, construction, and production can be obtained from the residue after military requirements have been met. To believe this is to ignore the facts. The number of persons in professional engineering has been increasing rapidly during the past few years. The increase can be attributed to an expansion of highly technical industries which in 1950 absorbed approximately 50,000 new graduates from engineering schools. A year earlier the number of graduates employed approached this same figure. At the present time employers are competing energetically for the services of the 30,000 prospective graduates in 1951. The experience of the past two years indicates that the present demand exceeds greatly that of the prewar period. Prior to the war the demand approached 20,000 graduates annually. It seems reasonable to assume that a fair estimate of requirements for the next decade would be in the neighborhood of 30,000 engineering graduates annually. This may be a conservative figure.

The estimated supply of engineering graduates for the next few years is indicated in the following tabulation. Column (3) indicates the estimated number of graduates if selective service takes none from these ranks. Estimates vary somewhat depending on the basic assumptions, but the numbers shown are believed to be the maximum which can be made available. These figures will be reduced by Selective Service withdrawals.

	Number of Graduates Annually	
(1) *Year*	(2) *Required*	(3) *Available assuming no Withdrawals by Selective Service*
1952	30,000	25,000
1954	30,000	14,500
1956	30,000	13,500
1958	30,000	13,500
1960	30,000	14,000

These data indicate clearly that the supply of new graduates will fall far short of the requirements for at least the next ten years. The large difference between supply and demand presents a real threat to the military security of the nation which is so closely tied to industrial production and professional competence. The shortage cannot be prevented. The low birth rate during the depression years effectively controlled that possibility. The situation can be alleviated only if more students are encouraged to enroll in engineering colleges, are allowed to complete their formal education, and then are placed in industry to gain experience. The engineer-power situation will be improved very little if immediately after graduation these trained but inexperienced engineers are inducted into the military service and used in nonprofessional jobs.

There are, of course, many positions in the military service which require professionally trained engineers. These positions increase the demand for engineer-power and compete with civilian industry for the scant supply available. Based on the ratio of men in the armed forces to the men in civilian employment at the peaks in 1945 (approximately 12,000,000 and 35,000,000 respectively) and on the functions performed, it seems evident that the number of engineers required in the military service would be much smaller than the number required in industry. Recent data indicate that twenty-seven per cent of the engineers in the armed forces in World War II had no opportunity to use their technical abilities. Others reported that their technical experience was used only slightly. These observations indicate that the number of professional engineers in the military service in 1941-46 either exceeded the requirements or that a high percentage was misassigned.

The supply of engineers, because it was cut off at the source, dried up quickly during World War II. Fewer than 5,000 were graduated in 1945. This result might well have been disasterous if the war had continued for a longer period of time. Under present circumstances the supply would dry up much quicker because a shortage of engineers already exists. An adequate supply cannot be obtained under the most favorable circumstances, much less from the residue after *all* military requirements are satisfied.

The fallacies discussed here create a block to an objective analysis of the engineer-power problem. Because they are assumed to be truths by many, no one wants to accept the responsibility for saying who shall be deferred and who shall be inducted into the armed service. Unjustifiable criticism is directed toward those making such decisions. But difficult decisions must be made all along the line. From the question, "who shall be inducted?" to "who shall be sent to the battle front?" and "who shall be dispatched on the most dangerous missions?", decisions must be made on the basis of the best information available. Data are available now which show without doubt that everything possible must be done to increase the supply of engineers.

Today's World

(*Continued from page* 13)

"know how" of creation, production, construction and operation.

In an item in our local press is a question and answer type of article entitled: "Let's Explore Your Mind!" One of the questions asked was: Scientists say, "The world's future is in the hands of the engineer". Is this because he builds railroads, machines, etc.? The answer was: Partly, but as psychologist Jack Dunlap pointed out at a national scientific meeting, the chief service of the engineer is not building machines but building and managing men.

If nothing else, engineers are realists. We deal best in tangible facts. Some of our greatest current development is, however, in dealing with less tangible facts, the humanities. But, as realists, we are concerned with those conditions in our profession which we know will adversely affect national security if improperly handled.

WE know that the future of our ability as a profession to serve the nation is directly dependent upon a continuous and increasing flow of properly qualified engineers.

At present there are about 400,000 professional engineers in this country of which about 160,00 are registered, professional engineers. In addition, during the past decade we have been examining and certifying young engineers upon graduation as Engineers-in-Training and this figure has now reached about 20,000.

It is now estimated that our country needs about 30,000 new engineering graduates each year. The big bulge in our crop of engineering graduates was reached in 1949 and 1950 when an annual total of 52,000 were graduated. The World War II years interrupting the normal training, and subsequent federal assistance in education to veterans, caused the great upswing in enrollment. In the late Forties, many forecast an oversupply of graduate engineers but this never happened because of two factors. One is that expanding industry and management have absorbed all the engineers we could graduate and now our returning war economy has added its demand for engineers to such a degree that there is actually an impending shortage.

I say impending because enrollment at engineering colleges has now dropped so markedly that by 1954 it is estimated that we shall graduate only about 11,000 engineers and this figure may be further reduced by manpower draft policies.

We believe that many high school seniors who would normally have gone on into engineering in college this past year were discouraged by some forecasts of overcrowding in the profession and now the situation of number being trained in engineering is reaching a serious low point. The national security of our country requires the reversal of these figures.

Recently our Society in a meeting at Little Rock adopted a policy statement on National Security. Its opening sentence states that the total welfare and security of the United States and not the best interests of any group or of any individual is the basic consideration for all questions to be resolved in this policy statement.

THIS statement covers suggestions for a four point policy for mobilization of engineers in the armed services and civilian industry and the maintaining of a continuous flow of students into college. High points in the recommendations include:

Armed services are to establish policy or review boards, composed of professionally - qualified officers of high rank who would be given adequate authority to establish policies, to investigate or cause to be investigated the apparent misuse of professional personnel and to recommend transfers of such personnel to appropriate assignments in an attempt to effect complete and most effective utilization of the professional personnel in the armed services.

Those who are best qualified to serve the national defense material production must not be allowed to be used for the less essential production of goods or services for the needs of the civilian population.

A national review authority should be established to consider applications for deferment from military service on the basis of employment in civilian research or production having a direct bearing on and relationship to the national defense effort, and such requests for deferment should originate from the employer.

A maximum number of engineering and science students must be allowed to complete their formal education and be allowed to acquire necessary experience to appropriately utilize the education acquired.

I believe we all appreciate that another World War will be a total war requiring a total effort. I believe all our physically fit young engineers should first be a part of our armed services and receive such military training and service as will enhance the above objectives—but, certainly, it is better to keep the properly trained and experienced engineering mind doing the more effective work in his proper groove here his results can often produce many fold the effect he might render if he were only on the firing end of a gun.

The outlook is so grim that we must use our most effective weapons (and in this case our manpower) in their proper places.

ALSO, in a total war, civil defense will issume more importance. The engineer is again in an excellent position to give needed effective help. If a bomb—whatever the variety—were to drop on a huge city in this country, present results would be disastrous. Planning for the proper handling of transportation, water supply for fire fighting and human consumption, demolition of unsafe structures, reestablishment of knocked-out power, light, communications and the like are properly in the engineer's lap. We are just now becoming serious about incorporating some flexibility and protection into these municipal services. Dispersal of our industries and communities, bomb shelters and similar topics are now under serious discussion and handling. Our engineers remaining on the home front have a great responsibility in the service they can render to their communities —and they are doing this in an ever increasing tempo.

As design engineers, we are looking at our end products in an entirely different attitude in order to appraise what its details should include to safeguard its continuing service in the light of sabotage or attack.

If I have overemphasized the importance of the engineer in all the scenes of our national defense, then let me say that all of us realize we are a part of a great cooperative team, each member of which has an important job to perform and that by a little advance planning and assumption of responsibility as outlined, the professional engineer can be a most effective cog in the great machine for our national defense. (*Editor's Note: This article was adapted from a recent talk by President Stolte before the Texas Society's* 15*the annual meeting.*)

Support the Public Relations Fund Drive

Tulsa Chapter Gets Handy Booklets Free From Oklahoma Firm

The Triangle Blue Print & Supply Company of Tulsa and Oklahoma City, Oklahoma, recently made and presented free of charge attractive little handbooks for the membership of the Tulsa Chapter, Oklahoma Society.

The little booklets contain much valuable information for the member, such as State and Chapter officers, the Canon of Ethics for the engineer, By-laws and a roster of Chapter members.

Films On Copper Viewed By Central Illinois Chapter

The Central Illinois Chapter of the Illinois Society met on January 25 at the Staley Club House in Decatur, Illinois. The program featured Mr. E. H. Bastedo of the Anaconda Wire and Cable Company, who gave an illustrated talk.

Mr. Bastedo presented two films; "Copper," dealing with mining, smelting and refining operations in Montana, and "Manufacture of Copper Wire of All Kinds." Following the showing of the two films and Mr. Bastedo's accompanying remarks, there was a question and answer period.

Support the Public Relations Fund Drive!

Harrisburg Chapter Of Pennsylvania SPE Holds Annual Meeting

The Harrisburg Chapter of the Pennsylvania Society held their Annual Meeting on January 15 at the Civic Club in Harrisburg. The program was highlighted by an address by Mr. Edward J. Brill, Director of Employee Relations for the Pennsylvania Power & Light Company.

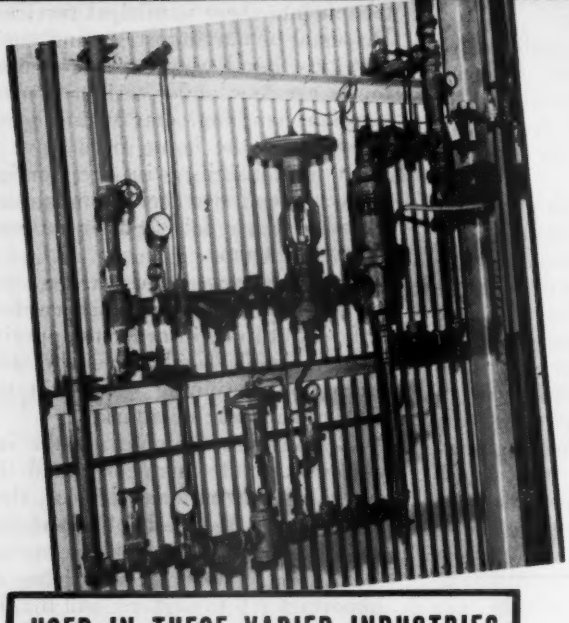
For his timely address, "Employer and Employee Relations," Mr. Brill drew upon his 32 years of experience in utility work with the company, during which time he has served in various capacities.

Other activities at the Annual Meeting included the announcement of the results of the balloting, and the installation of officers for 1951.

Tell Us About YOUR Group!

Is your Chapter or Society getting adequate coverage in the AMERICAN ENGINEER? If not, please remember that our staff is not psychic . . . WE HAVE TO HEAR FROM YOU IN ORDER TO WRITE IT UP! Get behind your officers and remind them to get the news into us, or if you see something you think might be of interest, just send it in. Be sure and tell us who, what, when and where, and remember to include *full* names. Photographs will also be useful, if properly captioned. How about it? Instead of just a few groups getting all the publicity, let's see *your* Chapter or Society in print next issue.

ENGINEERED to handle any HOT WATER problem!



Pick INSTANTANEOUS WATER HEATERS for ALL INDUSTRIAL NEEDS

★ PRODUCTION
★ MAINTENANCE
★ PROCESSING

Steam injection heats water INSTANTLY at any predetermined temperature from 40° to 180° F. No storage tanks required — units are compact to save space and installation cost. They can be cleaned in a matter of minutes.

PICK has the exclusive "Pressurizer Piston" that stabilizes injection pressure — eliminates pipe hammering and shaking. Available in seven sizes with rated capacities of 10 to 200 gallons per minute. Multiple units produce any volume required.

USED IN THESE VARIED INDUSTRIES

★ STEEL MILLS — Annealing, Electrolytic Plating
★ TEXTILES — Bleaching, Dyeing
★ FOOD PROCESSING — Dairies, Packing Plants
★ TANNERIES — Beams, Washers

Write for Engineering Details and Specifications
DEP. A M E

PICK MANUFACTURING COMPANY
WEST BEND, WISCONSIN